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# C-STARS Baltimore Simulation Center Military Trauma Training Program: Training for High Performance Trauma Teams

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**14. ABSTRACT**
During periods of peacetime, human patient simulation will provide hands-on training for military medical personnel for wartime-specific requirements. The Center for the Sustainment of Trauma and Readiness Skills (C-STARS), Baltimore and the R Adams Cowley Shock Trauma Center (STC) collaborated to create a jointly funded simulation center to support this need as well as training for civilian trauma programs. A 1200-ft$^2$ area conveniently located in STC opened in February 2012 equipped with four dedicated trauma bays, course management software, and advanced digital audio-video recording capacities. The center contains additional space for storage, a control room, and adjacent debriefing/conference space to support both the C-STARS and STC training missions. To date, over 500 military trainees and several civilian programs have made use of the new center. Additional work under this program included the development of four military-specific, multi-patient scenarios. These scenarios supplemented the previous C-STARS curriculum to replicate a high-workload setting and support discussion of teamwork and leadership in a high-stress environment. Finally, the completed work included an assessment of debriefing modalities. Twenty-four Air Force medical teams were evaluated for clinical and behavioral performance during recorded, simulated trauma resuscitations to determine whether a structured briefing (plus-delta, PD) influenced subsequent performance as compared to a more reflective style of debriefing (debriefing with good judgment, DGJ). Video review of before-after performance following debriefing showed no change in behavioral or clinical performance related to the debriefing style. Clinical performance did improve slightly, most likely because of practice. Recommendations from this study include a preference for the PD style when primary training focus is on technical or procedural performance and DGJ when focus is on behavioral performance elements such as leadership, communication, attention allocation, resource utilization, and situational awareness.

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## 1.0 SUMMARY

The R Adams Cowley Shock Trauma Center (STC) has excellent facilities in the management of traumatic injury and training. The U.S. Air Force Center for Sustainment of Trauma and Readiness Skills (C-STARS), Baltimore training program is an innovative training concept that embeds Air Force Medical Service personnel in high-volume trauma centers such as the STC to provide simulation and hands-on training in support of the Readiness Skills Verification program. Through joint funding, STC and C-STARS Baltimore have collaborated to expand their ability to support simulation-based training focused on management of the critically ill and injured patient. This collaboration has included the creation of a new simulation center capable of multi-patient simulation; development of military-specific, multi-patient scenarios; and evaluation of debriefing styles appropriate for the training of military personnel.

## 2.0 INTRODUCTION

The original proposal submitted in response to BAA 09-01, Section I. C. 3. Special Programs: Virtual Simulation/Military Trauma Training included the following objectives: the "[m]odernization of the Maryland STC [Shock Trauma Center] simulation and training environment that supports the STC and the co-located Air Force Center for Sustainment of Trauma and Readiness Skills (C-STARS) program" and "to improve military medical readiness and health care from the battlefield to stateside hospitals and clinics through modernized, interoperable, standardized simulation and training of medical personnel."

To address this relevant area, the original proposal incorporated a facility expansion including equipment and training methods to improve the quality of the simulation training offered at the C-STARS Baltimore site. In addition, the proposal focused on providing support for the newly established Air Force Medical Service (AFMS) simulation initiative with the ability to produce enduring products (training materials and scenarios) that would support this program while enhancing the C-STARS Baltimore simulation center with technical expertise and training and research capability in multi-patient trauma simulations. Our specific aims were: (1) to modernize and expand the capabilities of the C-STARS Baltimore and STC simulation programs, (2) to create validated multi-patient trauma assessment/resuscitation scenarios conforming to the AFMS Distributed Human Patient Simulation (DHPS) program, and 3) to evaluate and recommend debriefing strategies for use in the C-STARS and DHPS program.

## 3.0 BACKGROUND

### 3.1 Simulation-Based Training for Trauma

Since September 2001, the U.S. military has faced the daunting task of preparing medical personnel to manage combat casualties on a scale not seen in several decades. Exposure to trauma cases at most stateside training locations is limited, with many types of combat injuries, such as blast injuries and high-velocity gunshot wounds, rarely seen in the civilian setting. Even when exposure to real-world trauma cases is available to military providers, the care of combat casualties in a deployed setting creates unique challenges not encountered in the U.S. In response to this need, the military instituted a number of training programs utilizing a mix of clinical (civilian trauma), animal, and simulation-based approaches [1-5].



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With recent efforts to decrease the use of live animal models for trauma training and limited access to clinical cases, simulation-based training is receiving increased attention. The use of simulation-based training has occupied an increasingly important role in trauma training for civilian programs as well [6-8]. The evidence linking simulation-based training to improvements in real-world performance or skill acquisition time, however, is limited. The majority of studies examining the impact of simulation-based education for trauma management have not incorporated subsequent clinical performance as an outcome measure. The majority have used repeat exposure to simulation to assess the effectiveness of the original training program [9-12]. Two studies, however, have made an attempt to look at the impact of simulation-based education on subsequent performance. Sohn and colleagues at Madigan Army Medical Center surveyed 140 Army medics who completed the Tactical Combat Casualty Course at Madigan and subsequently deployed to Iraq for 1 year [2]. The course integrated didactic, simulation, and live tissue training over a 5-day period. On return from their deployment, 99% of the medics felt the course helped with their ability to provide battlefield care. Although limited by a lack of objective measures such as patient outcomes or procedural performance data, the authors state that the use of simulation and live tissue models added significantly to the medics' preparation for combat casualty care.

In the only study evaluating real-world outcomes and simulation-based trauma training, Steinemann et al. examined the impact of in situ simulation training on real-world trauma team performance [13]. The investigators evaluated the impact of a 4-hour course (1 hour of didactic material and three scenarios using high-fidelity human patient simulators followed by detailed debriefing sessions) on teamwork, time to task completion, and patient outcomes. Post-training trauma resuscitations showed a 16% reduction in time to completion, 76% improvement in near-perfect task completion, and improvement in mean teamwork scores. There were no significant changes noted in patient outcomes including mortality, hospital days, or intensive care unit days.

Despite the lack of evidence linking the use of simulation-based trauma training to an improvement in time to skill acquisition, clinical outcomes, or teamwork performance, it is likely that simulation-based training will continue to be a part of the military's solution to prepare physicians, nurses, and medics for their wartime responsibilities. Simulation-based medical education offers a safe and "mistake forgiving" environment to teach and train medical professionals. The diverse range of medical simulation modalities enables trainees to acquire and practice an array of tasks and skills. Simulation-based education offers the field of trauma training multiple opportunities to enhance the effectiveness of the education provided in this challenging domain. Further research is needed to better understand the role of simulation-based learning in trauma management and education with a particular emphasis on real-world outcomes.

### 3.2 Team Performance and Multi-Casualty Management

In the area of trauma management, simulation-based education has most commonly focused on procedural training. Mannequins are frequently used to teach intubation, surgical airway skills, chest tube placement, and hemorrhage control [1]. Simulation-based training with the use of high-fidelity human patient simulators offers the ability to look beyond specific procedures and to allow trainers to focus on team skills such as leadership, communication, situational awareness, and resource utilization. Team performance during high-intensity situations is vital for trauma teams, who must prepare to perform under extreme high workload



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conditions when resuscitating multiple severely injured patients. Trauma teams have used simulation for training, yet existing emphasis and knowledge have been on single patients. Experiences in high-volume trauma centers and current military deployments have shown the need for skills to treat multiple patients in a short time.

Aviation is the pioneering field in using simulation to train in the critical skills needed in low-occurrence, high-risk events. Due to the similarity in high risks, many individuals and programs within the medical field have recognized the same potential for the use of simulation to enhance a wide range of medical and surgical specialties. AFMS has undertaken an effort to integrate medical simulation efforts and establish a unified curriculum that supports operational requirements. This unified curriculum provides a framework for standardizing and distributing existing curriculum within AFMS. To support these efforts, we designed the C-STARS Baltimore site to allow for the creation and conduct of multi-patient scenarios for incorporation into other AFMS simulation programs.

### 3.3 Debriefing in Simulation-Based Training

Educators have recognized the importance of debriefing as a component of simulation-based training for a number of years [14], although few comprehensive studies have examined outcomes associated with debriefing techniques [15]. Debriefing in this setting can be defined as "facilitated or guided reflection in the cycle of experiential learning" [16]. In experiential learning, experience is the major source of learning, although both thinking and doing are required and must be linked in the minds of the learner. The concept of reflection on an event or activity and subsequent analysis is the cornerstone of the experiential learning experience. Facilitators or debriefers guide this reflective process.

The importance of debriefing cannot be understated. Adult learners do best when they are actively engaged in the learning process, play a role, and experience a concrete event, but also are able to process the events in an emotional fashion. It is this last element where debriefing becomes most important. In practice, not everyone is capable of analyzing, making sense of, and assimilating learning experiences on his/her own, particularly in team-based training exercises. The attempt to bridge this gap between experiencing and reflecting on an event is what led to the need for debriefing [16]. This element is so important that many experts believe that feedback (or debriefing) is the most important feature of simulation-based education [14].

Despite agreement on the importance of debriefing in simulation-based education, little data exist regarding debriefing as part of the learning process [15]. Raemer and colleagues [15] recently published a review of research in the area of debriefing for simulation-based education and identified several areas where obvious gaps existed. These included comparison of debriefing techniques, trained versus untrained debriefers, and different debriefing venues and times.

The debriefing style may have a significant effect on the trainee's assessment and improvement following simulation-based training. There is no one accepted methodology for the conduct of an effective debriefing session. Fanning and Gaba have published an excellent review that covers general approaches to the conduct of debriefings in simulation-based education [16]. There are also some specific types of debriefing that focus on different aspects of training and participant responses. One common form of debriefing prevalent in the military system is the plus-delta (PD) debrief. In the PD method, group discussion focuses on "what went well" and "what could we have done better," which tends to emphasize procedural or structured elements



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of the simulation [17]. An alternative approach has been offered by Rudolph and colleagues called "debriefing with good judgment" (DGJ), which relies on advocacy-inquiry to investigate the trainees' frames of reference for the observable actions elicited during simulation-based exercises [18,19]. Typically, most after-action reviews take either a judgmental or non-judgmental approach that may significantly impair the goal of improving future performance. With judgmental debriefing, the instructor becomes the only one with the answers and the trainee carries all of the error with the presumption that the essential failure in performance lies solely in the hands or thoughts of the trainee. This runs the risk of humiliating or embarrassing the trainee in a public setting with disruption of the learning process. With the non-judgmental approach, the debriefer tends to avoid any negativity by filtering out critical insights or by avoiding the observed problems altogether. By avoiding critical thoughts and feelings and limiting the debriefing to safe, nonthreatening topics, crucial areas of learning and potential improvement are not addressed in the session. The use of DGJ has been proposed to improve the chances that the trainee will hear and process what the instructor is saying without being defensive or having to guess the instructor's critical judgment.

Given the lack of information regarding the impact of debriefing style on subsequent simulation-based performance, we hypothesized that DGJ as compared to PD style debriefing would improve subsequent performance on team-based performance measures during simulated trauma resuscitations in a group of U.S. Air Force medical personnel. Alternatively, the more task oriented PD style of debriefing using a checklist could produce greater improvement in clinical performance measures.

## 4.0 METHODS

### 4.1 Simulation Capability Expansion (Task 1)

**Task 1**. To modernize and expand the capabilities of the C-STARS Baltimore and R Adams Cowley STC simulation program.

Prior to the initiation of this project, both the STC and C-STARS programs had full-time access to the Maryland Advanced Simulation, Training, Research and Innovation (MASTRI) Center. This access was limited to a single simulation room and intermittent access to conference and debriefing space. While the C-STARS program had priority for access to this space, it had to compete with other programs for additional training space and could effectively run a single patient simulation at one time.

Expansion of the simulation capabilities of both the STC and C-STARS programs required dedicated space. Discussions with the University of Maryland Medical Center and STC leadership identified space in the basement of STC that would meet the training requirements of both programs. Ongoing construction within STC significantly delayed the completion of this space, and it did not become available until February 2012.

The new simulation center (Figure 1) includes four trauma bays (Figure 2A) configured with digital audio-video recording capability, four human patient simulators (two adult SimMan, one Multiple Amputation Trauma Trainer (MATT), and one baby SimBaby), in-wall pressurized gases, and expansion capability for new simulators in a 1200-$ft^2$ dedicated space. A control room (Figures 2B and 2C) is located at one end allowing up to three simulation operators and several observers to monitor and control training sessions. A course management system (SimCapture, BLine Medical, Washington, DC) provides support for scheduling, assessment, and review of



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training sessions as well as support of this project and other research activities (Figure 3). Additional space includes sufficient storage for current training programs and a dedicated conference and debriefing room (Figure 2D) immediately adjacent to the simulation bays.

Funding for the project exceeded the costs for construction in this proposal, and STC covered these anticipated costs per the original proposal. Estimated cost support from STC is $300,000. Overall control for scheduling resides with the C-STARS Baltimore program. To date, the current C-STARS staff has been extremely satisfied with the new site.

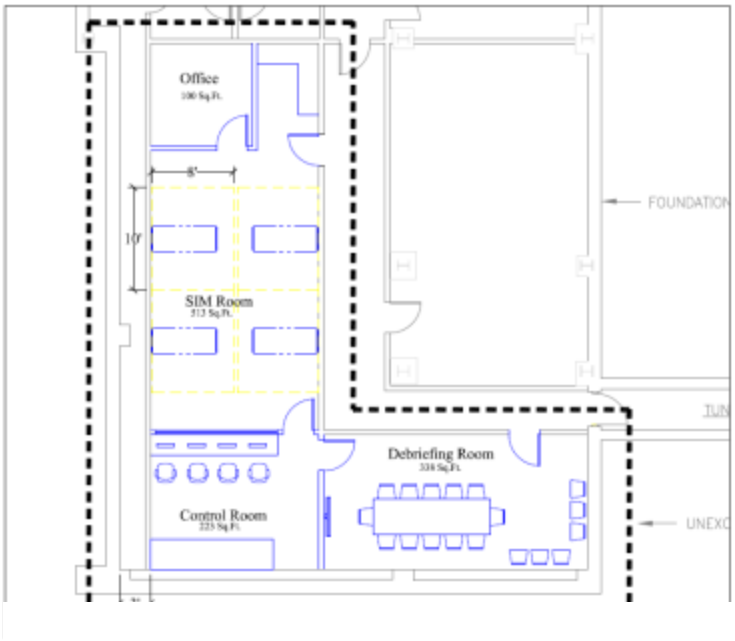

**Figure 2. View of New Simulation Site. (A) 2 Trauma Simulation Bays, (B) View from Control Room into Trauma Simulation Bays, (C) Audio-Video and Server Rack Supporting Simulation Center, (D) Debriefing Room with Large, Flat Screen Monitor**



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**Figure 3. Screen Shots from SimCapture Software (BLine Medical, Washington, DC)**

## 4.2 Multi-Patient Scenarios (Task 2)

**Task 2**. To create validated multi-patient trauma assessment/resuscitation scenarios conforming to the AFMS DHPS program.

The original proposal included the development of four multi-patient scenarios. Although initially listed as separate objectives in the Statement of Work, the investigators had planned to use these scenarios in conjunction with the debriefing assessments. Delays in construction prevented the C-STARS program from moving out of MASTRI until early 2012. Due to these delays and at the request of the C-STARS commander at the time, the investigators were not able to work on the multi-patient scenarios until after the move. Given the need to have consistent performance of both the debriefers and simulation operators during the period of data collection, the investigators chose to proceed forward with the previously used and validated single-patient scenarios for the debriefing assessment.

To meet the requirement for the creation of multi-patient scenarios, the C-STARS faculty integrated two additional training sessions into the curriculum, allowing for the development these scenarios. The C-STAR and STC faculty initially developed the patient and integrated simulations during curriculum review sessions in February and March 2013. During the months of April-June 2013, the simulations were run for the C-STARS classes and the results reviewed for internal and face-value validation. The scenarios were submitted in June 2013 and are included in Appendix A.

## 4.3 Debriefing Assessment (Task 3)

**Task 3**. To evaluate and recommend debriefing strategies for use in the C-STARS and DHPS programs.

Debriefing assessments were conducted as a randomized, controlled, block design trial. From September 2012 through April 2013, 24 Air Force teams completed the introductory simulation-based training sessions on DOT 1 of their C-STARS training program. Teams were selected by C-STARS faculty to balance for nurse, technician, and physician composition. As a part of the DOT 1 curriculum, all teams completed two scenarios with similar traumatic injuries and physiology requiring similar resuscitation approaches. Following the first simulation



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exercise, the team underwent debriefing with one of the two debriefing assessment styles as described above, DGJ or PD. A second simulation was completed immediately following the debriefing. In addition, the debriefing for the second scenario was conducted in a different style to allow for crossover comparisons (Figure 4).

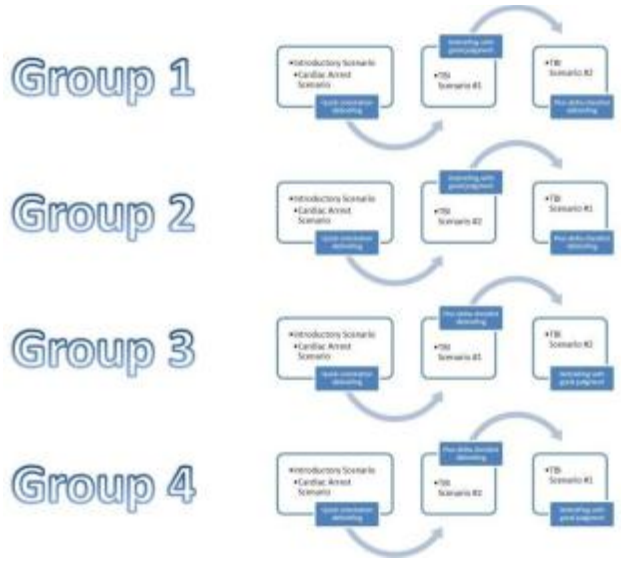


**Figure 4. Block Design for Debriefing Styles**

The primary outcome measures were the change in clinical performance and non-technical skills (leadership, teamwork, communication, etc.) based on the style of debriefing between the two sessions. The clinical performance was assessed by a Clinical Performance Tool (CPT) created specifically for the scenarios that captured the key elements of clinical performance (Appendix B). The non-technical skills were assessed using the Behavioral Assessment Tool (BAT) (Appendix C) [20]. Additionally, all debriefers were evaluated by the students and the external reviewers using the Debriefing Assessment for Simulation in Healthcare (DASH) (Appendix D). This tool was created at the Center for Medical Simulation in Boston, MA, and includes six debriefing elements crucial to facilitation of an effective debriefing session [15]. For this study, the DASH was modified to drop the first element, which evaluated the quality of the pre-brief. In this study, two groups were run concurrently in each session and a combined pre-briefing was accomplished prior to each simulation session. The reviewers were not able to see the pre-brief, since components of the pre-brief occurred in several locations and were done by a single debriefer.

Each video (simulation session and debriefing) was reviewed by three reviewers. The simulation sessions were scored for the CPT and BAT, while the debriefing session was scored for the modified DASH. The scores for each assessment were averaged to provide a final score for clinical, non-technical, and debriefing performance. The trainees also completed DASH assessments for each debriefing (after the first and second session). This allowed a comparison of student performance to student's perceived quality of debriefing. Finally, the in-room faculty providing support for each session also completed the BAT to allow for comparisons between rapid, in-room assessments to those done with video recordings in a *post hoc* fashion.



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## 5.0 RESULTS

In total, 24 teams were evaluated in this study. All teams completed both scenarios and underwent debriefing. The summary statistics are shown in Table 1. Due to a scheduling error on the protocol, 9 teams received DGJ-style debriefing following the first scenario and 15 teams underwent PD. This did not affect the validity of the results.

The BAT reported by the in-room observers was 25.4 ± 7.9 [mean ± standard deviation (SD)] for the first scenario and 24.4 ± 7.2 for the second. For the reviewers, the BAT was 18.4 ± 7.3 for the first scenario and 20.5 ± 6.1 for the second. When comparing before and after performance by paired *t*-test, there was no overall improvement in the BAT recorded by either the observer (Figure 5A; $p = 0.66$) or the reviewers (Figure 5B; $p = 0.27$) from the first to second scenarios regardless of debriefing strategy. The overall CPT scores reported by the reviewers were 26.7 ± 4.7 for the first scenario and 28.6 ± 3.1 for the second. This improvement was significant (Figure 6; $p = 0.04$).

**Table 1. Summary Data from 24 Teams Completing Study**

| Date | Team | Simulation Type | Sequence | Debriefing Style | No. of Students (n) | Observer BAT (mean) | Student DASH (mean ± SD) | Student-Modified DASH (mean ± SD) | Reviewer CPT (mean) | Reviewer CPT (mean) | Reviewer-Modified DASH (mean) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 9/3/2012 | A | Adult | 1 | PD | 5 | 20 | 41.4 ± 0.9 | 34.6 ± 0.5 | 16.3 | 27.0 | 28.3 |
| 9/3/2012 | B | Baby | 1 | PD | 5 | 31 | 33.2 ± 7.0 | 27.6 ± 5.9 | 7.0 | 24.3 | 27.3 |
| 9/3/2012 | B | Adult | 2 | DGJ | 5 | 28 | 33.2 ± 7.0 | 27.6 ± 5.9 | 15.5 | 25.5 | 24.3 |
| 9/3/2012 | A | Baby | 2 | DGJ | 6 | 23 | 40.3 ± 1.5 | 34.0 ± 0.9 | 22.7 | 29.7 | 19.3 |
| 9/3/2012 | C | Adult | 1 | PD | 6 | 36 | 39.5 ± 2.9 | 33.0 ± 2.4 | 24.0 | 30.0 | 29.7 |
| 9/3/2012 | D | Baby | 1 | DGJ | 7 | 36 | 40.4 ± 2.7 | 33.7 ± 2.2 | 12.7 | 24.7 | 25.0 |
| 9/3/2012 | D | Adult | 2 | PD | 7 | 33 | 40.0 ± 3.4 | 33.3 ± 2.9 | 22.5 | 30.5 | 26.0 |
| 9/3/2012 | C | Baby | 2 | DGJ | 6 | 20 | 38.3 ± 2.6 | 32.2 ± 2.3 | 14.5 | 26.5 | 25.0 |
| 10/1/2012 | B | Baby | 1 | PD | 7 | 23 | 36.6 ± 4.0 | 31.1 ± 3.2 | 21.5 | 26.0 | 25.0 |
| 10/1/2012 | A | Adult | 1 | PD | 7 | 27 | 38.4 ± 3.4 | 32.6 ± 2.4 | 16.5 | 22.5 | 24.0 |
| 10/1/2012 | A | Baby | 2 | DGJ | 7 | 20 | 36.6 ± 2.3 | 30.4 ± 2.1 | 22.3 | 27.7 | 23.3 |
| 10/1/2012 | B | Adult | 2 | DGJ | 7 | 12 | 37.3 ± 3.2 | 31.7 ± 2.8 | 19.0 | 28.0 | 25.0 |
| 10/1/2012 | D | Baby | 1 | PD | 7 | 19 | 37.6 ± 5.5 | 31.6 ± 4.5 | 13.0 | 25.5 | 25.5 |
| 10/1/2012 | C | Adult | 1 | PD | 6 | 29 | 38.0 ± 4.4 | 31.7 ± 4.1 | 24.0 | 30.3 | 28.3 |
| 10/1/2012 | C | Baby | 2 | DGJ | 6 | 31 | 37.2 ± 4.5 | 31.2 ± 4.1 | 25.5 | 25.5 | 24.5 |
| 10/1/2012 | D | Adult | 2 | DGJ | 7 | 31 | 39.1 ± 4.8 | 32.7 ± 4.1 | 21.5 | 37.5 | 29.0 |
| 11/26/2012 | A | Adult | 1 | PD | 8 | 36 | 40.8 ± 1.6 | 34.1 ± 1.4 | 30.3 | 38.0 | 31.0 |
| 11/26/2012 | B | Baby | 1 | PD | 6 | 21 | 39.8 ± 2.6 | 33.3 ± 2.1 | 14.5 | 21.0 | 24.5 |
| 11/26/2012 | A | Baby | 2 | DGJ | 8 | 36 | 40.8 ± 1.4 | 34.3 ± 1.2 | 13.0 | 32.3 | 20.0 |
| 11/26/2012 | B | Adult | 2 | DGJ | 6 | 25 | 40.2 ± 2.4 | 33.5 ± 2.0 | 26.7 | 22.0 | 29.0 |
| 11/26/2012 | C | Baby | 1 | DGJ | 6 | 24 | 34.7 ± 2.7 | 28.8 ± 2.3 | 9.0 | 23.3 | 25.3 |
| 11/26/2012 | D | Adult | 1 | DGJ | 7 | 14 | 41.0 ± 1.5 | 34.3 ± 1.1 | 8.7 | 21.0 | 25.3 |
| 11/26/2012 | D | Baby | 2 | PD | 7 | 21 | 40.9 ± 2.3 | 34.0 ± 1.9 | 15.0 | 25.5 | 21.0 |
| 11/26/2012 | C | Adult | 2 | PD | 6 | 27 | 38.8 ± 3.2 | 32.3 ± 2.7 | 15.3 | 29.0 | 23.3 |
| 1/7/2013 | B | Baby | 1 | PD | 9 | 15 | 37.7 ± 3.5 | 31.7 ± 3.0 | 10.3 | 22.3 | 14.3 |
| 1/7/2013 | A | Adult | 1 | PD | 9 | 15 | 38.2 ± 5.4 | 31.7 ± 4.7 | 14.5 | 26.5 | 29.0 |
| 1/7/2013 | A | Baby | 2 | DGJ | 9 | 30 | 40.3 ± 2.1 | 33.7 ± 1.7 | 25.7 | 31.0 | 27.0 |
| 1/7/2013 | B | Adult | 2 | DGJ | 9 | 27 | 40.2 ± 2.3 | 33.8 ± 1.9 | 17.7 | 28.0 | 32.3 |
| 1/7/2013 | C | Baby | 1 | DGJ | 7 | 22 | 31.9 ± 3.8 | 26.6 ± 3.2 | 19.0 | 27.5 | 25.5 |
| 1/7/2013 | D | Adult | 1 | DGJ | 5 | 37 | 39.8 ± 2.9 | 33.2 ± 3.0 | 23.7 | 28.3 | 29.3 |
| 1/7/2013 | D | Baby | 2 | PD | 5 | 30 | 38.8 ± 2.6 | 32.6 ± 2.5 | 29.0 | 29.0 | 15.5 |
| 1/7/2013 | C | Adult | 2 | PD | 7 | 24 | 34.0 ± 3.7 | 28.3 ± 2.9 | 15.7 | 32.0 | 26.0 |
| 3/4/2013 | A | Adult | 1 | PD | 7 | 18 | 38.3 ± 4.7 | 31.9 ± 3.9 | 23.0 | 28.3 | 29.7 |
| 3/4/2013 | B | Baby | 1 | DGJ | 6 | 35 | 38.3 ± 3.4 | 32.2 ± 2.8 | 19.0 | 25.0 | 20.3 |
| 3/4/2013 | A | Baby | 2 | PD | 7 | 22 | 37.6 ± 4.4 | 31.3 ± 3.5 | 9.3 | 31.5 | 26.0 |
| 3/4/2013 | B | Adult | 2 | DGJ | 6 | 6 | 40.3 ± 2.1 | 33.7 ± 1.8 | 31.0 | 24.7 | 32.0 |
| 3/4/2013 | C | Baby | 1 | DGJ | 6 | 19 | 39.3 ± 2.2 | 33.3 ± 2.0 | 11.0 | 24.3 | 19.3 |
| 3/4/2013 | D | Adult | 1 | PD | 5 | 34 | 41.8 ± 0.4 | 34.8 ± 0.4 | 21.3 | 18.5 | 30.5 |
| 3/4/2013 | D | Baby | 2 | PD | 5 | 26 | 38.9 ± 4.0 | 32.6 ± 3.2 | 19.0 | 27.7 | 19.0 |
| 3/4/2013 | C | Adult | 2 | DGJ | 6 | 15 | 41.0 ± 1.3 | 34.5 ± 0.8 | 12.0 | 29.0 | 30.0 |
| 4/1/2013 | A | Adult | 1 | PD | 8 | 33 | 36.9 ± 3.7 | 30.6 ± 3.4 | 32.7 | 32.3 | 21.0 |
| 4/1/2013 | B | Baby | 1 | PD | 9 | 16 | 36.9 ± 4.5 | 30.7 ± 4.0 | 29.5 | 37.0 | 28.0 |
| 4/1/2013 | A | Baby | 2 | DGJ | 8 | 30 | 34.9 ± 4.0 | 29.3 ± 3.3 | 24.0 | 30.0 | 21.3 |
| 4/1/2013 | B | Adult | 2 | DGJ | 8 | 15 | 37.6 ± 3.4 | 31.8 ± 3.0 | 25.0 | 27.7 | 29.0 |
| 4/1/2013 | C | Baby | 1 | DGJ | 8 | 30 | 36.4 ± 4.9 | 30.3 ± 4.2 | 13.7 | 29.3 | 20.0 |
| 4/1/2013 | D | Adult | 1 | DGJ | 5 | 20 | 38.4 ± 3.9 | 31.8 ± 3.4 | 27.0 | 27.0 | 30.7 |
| 4/1/2013 | C | Adult | 2 | PD | 8 | 22 | 38.1 ± 4.1 | 31.9 ± 3.2 | 18.7 | 27.3 | 23.7 |
| 4/1/2013 | D | Baby | 2 | PD | 5 | 31 | 38.9 ± 4.0 | 32.6 ± 3.2 | 31.7 | 29.3 | 22.5 |



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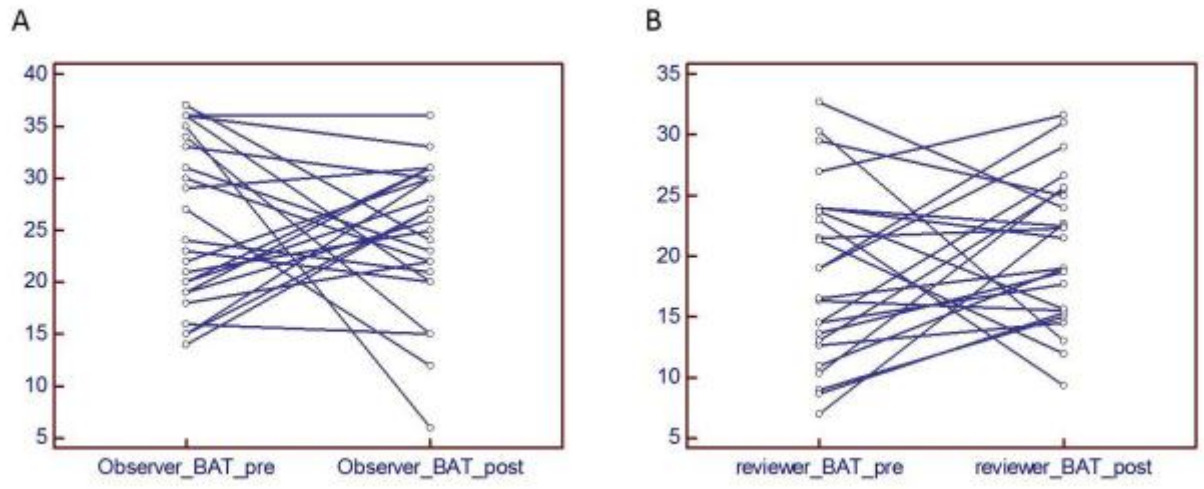
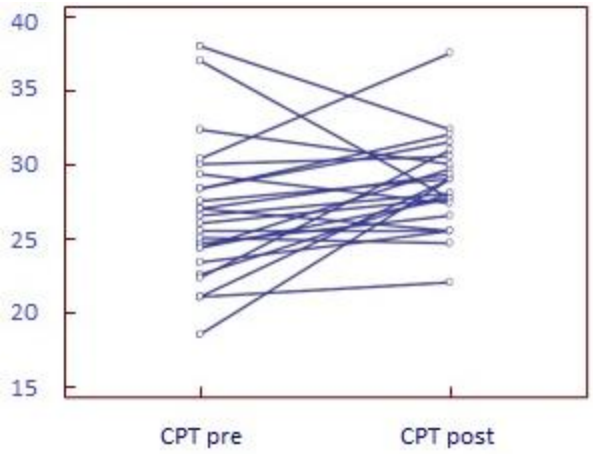



**Figure 5. Pre- and Post-Intervention BAT Scores for Observers and Reviewers. (A) BAT Scores Reported by In-Room Observers for the First (Pre) and Second (Post) Scenarios, (B) Mean BAT Scores Reported by the Reviewers for the First and Second Scenarios**




Using an analysis of covariance to assess the impact of debriefing style (DGJ vs. PD) and the potential confounding factor of simulator type (adult vs. child), the style of debriefing was not associated with significant changes in subsequent BAT or CPT scores. Significant changes in both reviewer BAT and CPT scores were associated with the starting scenario (child vs. adult; $p = 0.035$ and $p = 0.023$, respectively). The observer BAT score was not significantly associated with the starting simulator type.

There was a relatively weak but significant correlation observed between the in-room observer BAT scores and those from the reviewers (Figure 7). There was a stronger, significant correlation between the reviewers' scores for CPT and BAT (Figure 8). There was, however, no



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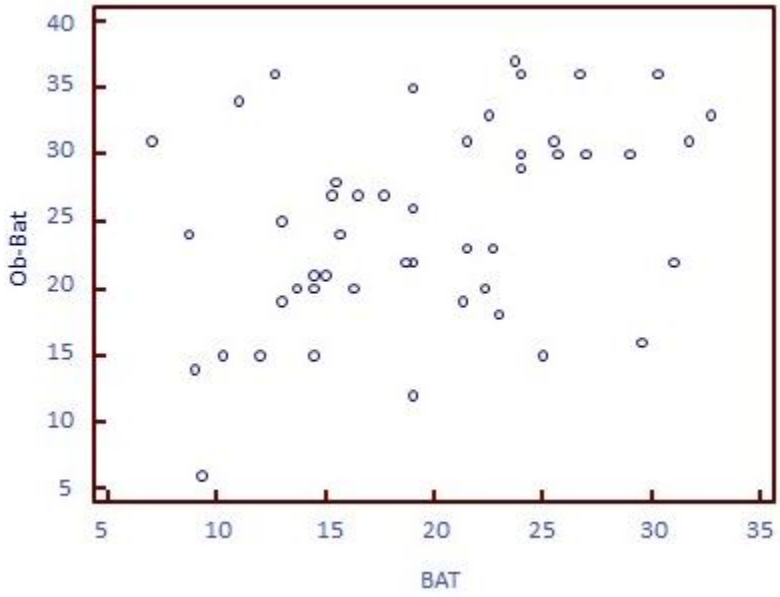
correlation observed between the student-modified DASH scores and those reported by the reviewers (Figure 9). Similarly, the observer BAT score did not correlate with the reviewers' CPT score (Figure 10).



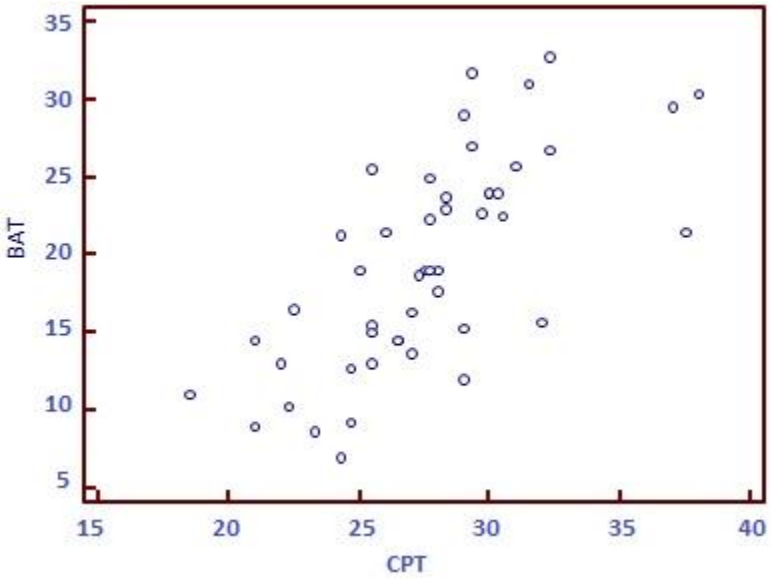




**Figure 8. Correlation Plot of Reviewer BAT and CPT Scores ($r$ = 0.70, $p$ < 0.0001)**



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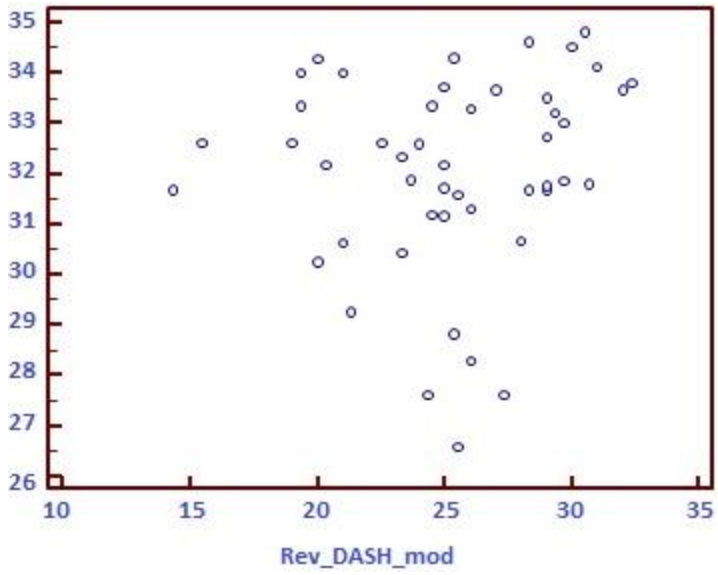


**Figure 9. Correlation Plot of Student-Modified DASH (Student_DASH_mod) and Reviewer-Modified DASH (Rev_DASH_mod) Scores ($r$ = 0.14, $p$ = 0.36)**

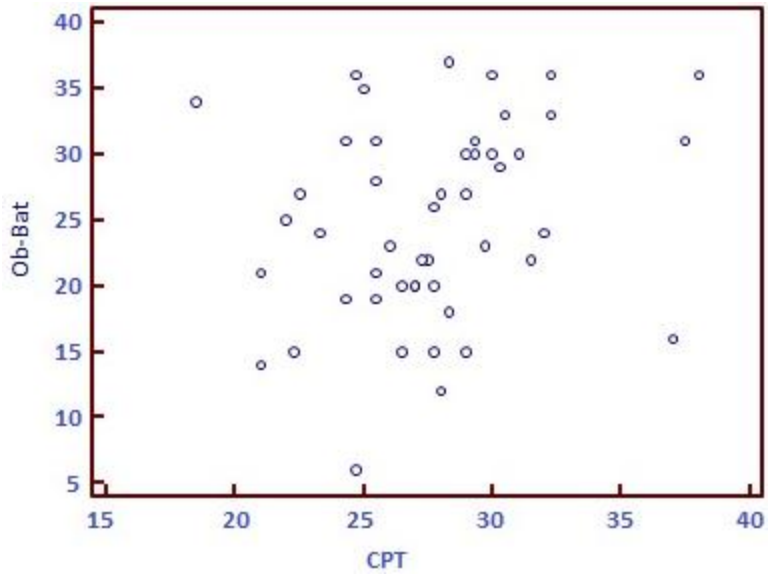


**Figure 10. Correlation of Observer BAT (Ob-Bat) and Reviewer CPT (CPT) Scores ($r$ = 0.25, $p$ = 0.09)**

When looking at the impact of simulator type on scoring between the first and second simulation session, the only identified difference was found for the reviewer BAT score on the child simulator during the second session compared to the adult simulator on the second session, suggesting a larger improvement when moving from the adult to child simulator (Figure 11). There were no statistical changes noted on BAT and CPT scores based on debriefing strategy as noted above (Figure 12).



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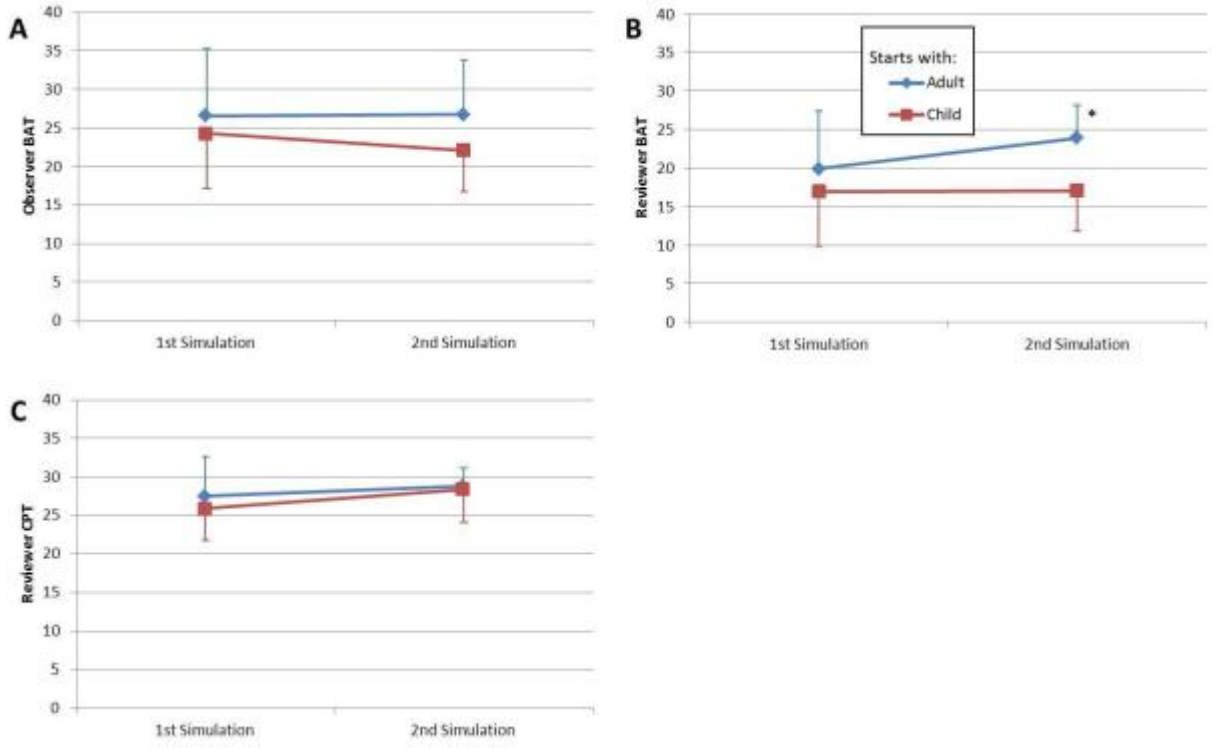


**Figure 11. Change in BAT and CPT Scores Between Scenarios Based on Initial Simulator Type Used in First Scenario (mean ± SD; *$p < 0.05$ starting with child simulator)**

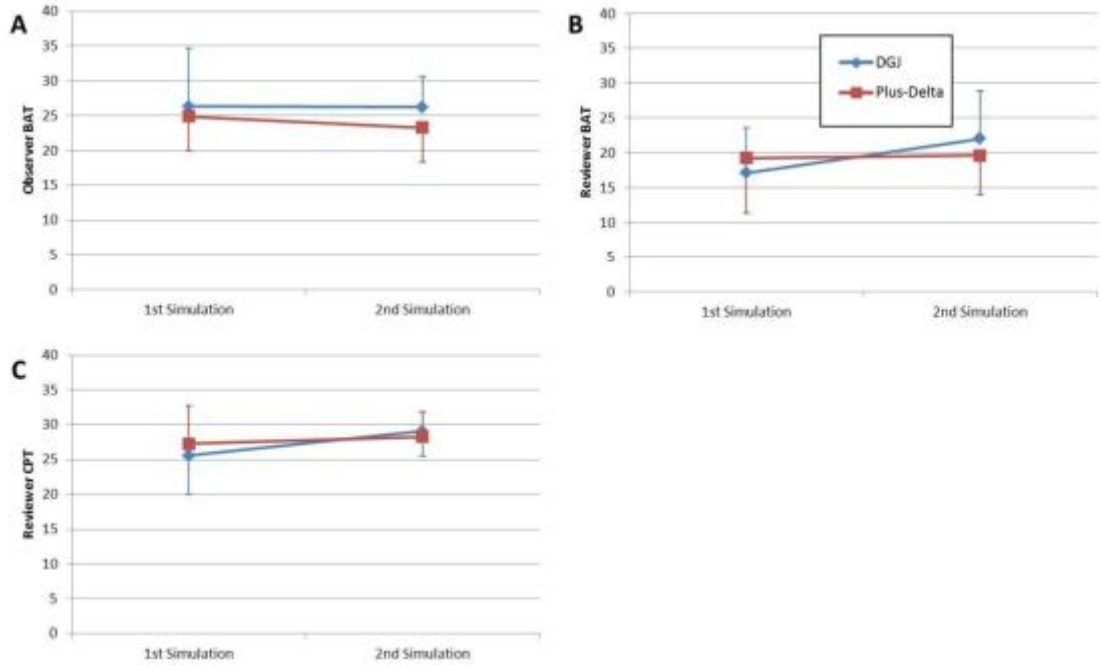


**Figure 12. Change in BAT and CPT Scores Between Scenarios Based on Debriefing Style (mean ± SD)**



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One final finding concerns the modified DASH scores. While there was no correlation between the student- and reviewer-modified DASH scores, there was a strong relationship based on a paired *t*-test ($p < 0.001$). The linked pairs are shown below in Figure 13.

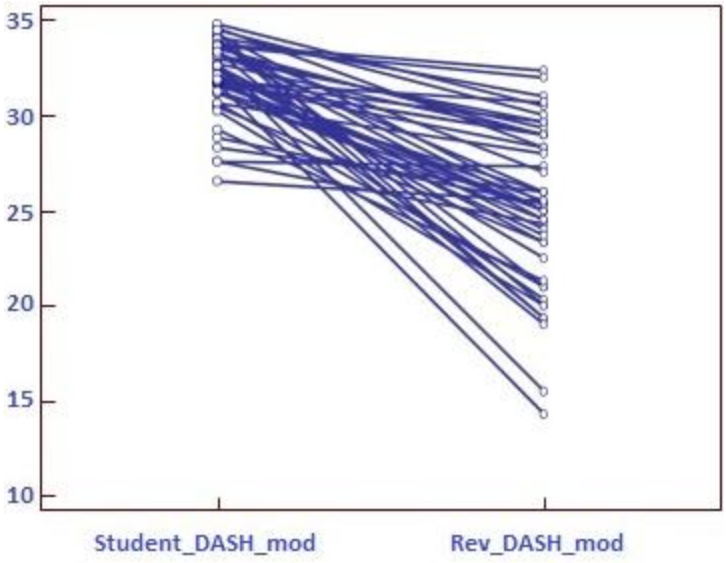


**Figure 13. Relationship of Student-Modified DASH (Student_DASH_mod) and Reviewer-Modified DASH (Rev_DASH_mod) Scores ($p > 0.0001$)**

## 6.0 DISCUSSION

The primary focus of this project was twofold: 1) to modernize the STC simulation and training environment that supports the STC and the co-located C-STARS program and 2) to "improve military medical readiness and health care from the battlefield to stateside hospitals and clinics through modernized, interoperable, standardized simulation and training of medical personnel." This led to the establishment of three tasks as outlined above:

**Task 1**. To modernize and expand the capabilities of the C-STARS Baltimore and R Adams Cowley STC simulation program.

**Task 2**. To create validated multi-patient trauma assessment/resuscitation scenarios conforming to the AFMS DHPS program.

**Task 3**. To evaluate and recommend debriefing strategies for use in the C-STARS and DHPS programs.

Task 1 was addressed through a combined effort with funding from FA7014-10-2-0003 and STC to create a 1200-ft$^2$ dedicated simulation-training space that met the needs of the C-STARS Baltimore program to conduct more sophisticated and complex training than was available in the previous simulation center. To date, 16 C-STARS classes have made use of the facility with increasing integration of simulation-based education into the curriculum. In



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FY2009, students spent approximately 1 hour in direct simulation-based training with additional time making use of partial task trainers or equipment familiarization. Currently, students spend up to 6 hours with direct simulation-based training, and the use of partial task trainers has expanded to include ultrasound training (VIMEDIX, CAE, Sarasota, FL) and hemorrhage control (MATT, KGS, Fairfax, VA). The increased flexibility has allowed the C-STARS staff to integrate multi-patient scenarios into the simulation-based training with a focus on communication, resource allocation, and situational awareness in a mass casualty environment. Overall, the C-STARS staff has been making excellent use of the space and resources, with plans to continue expanding its integration of simulation into the C-STARS curriculum when clinical material is insufficient or new training/procedures are introduced through changes in doctrine.

Task 2 highlights one of the situations faced more frequently in the military setting. The early management of the trauma patient in the civilian setting is more often focused on an individual patient rather than a mass casualty situation. In ongoing conflicts, almost one-third of trauma patients arrive in a mass casualty presentation [21]. The majority of simulation-based training to date for trauma management continues to focus on single-patient scenarios [6,9-12] more suitable to civilian practice.

To address this need, four multi-patient scenarios were created and tested with the C-STARS students (Appendix A). This portion of the work presented several challenges due to the delays in construction of the new STC/C-STARS simulation site. The prior training location in the MASTRI Center did not allow for sufficient floor space or audio-visual support to conduct multi-patient scenarios. In addition, the C-STARS commander felt the attempt to expand beyond the space in MASTRI would be too disruptive to the course schedule and requested that this portion of the work be delayed until the new location was up and running. When the new site became available in February 2012, an additional problem arose with the rapid turnover of simulation operators that did not stabilize until early 2013. Since that time, the C-STARS program has incorporated two multi-patient scenarios into each course with up to three patients in each scenario. They have also integrated a recently acquired simulator, MATT, which focuses on hemorrhage control techniques and provides an added stressor to the simulation.

C-STARS personnel have found the addition of multi-patient scenarios to be particularly beneficial in the area of non-technical skills. With a single designated leader for each team, issues of communication, attention allocation, resource management, and situational awareness can be readily addressed through integrated video analysis and debriefing. It is anticipated that this component of the work will continue to be used and expanded in future classes to directly address a perceived need of the AFMS simulation community.

Finally, in Task 3 we directly addressed one of the many unknowns related to the conduct of simulation-based education. It has been stated that “feedback (including debriefing) is the most important feature of simulation-based education,” yet there is very little published research in this area [16]. In a recent selective critical review of the relevant literature surrounding simulation-based education, a panel of experts in the area of simulation and debriefing worked to review the existing literature in the area and identify areas of interest for future research [15]. Topic areas they identified included the following:

1. Creation and evaluation of tools and programs to assist in the training of simulation debriefers
2. Evaluation of the impact of debriefing training programs on learner outcomes
3. Selection of optimal debriefing methods for improving learner outcomes



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4. Determination of optimal timing and venue for debriefing
5. Determination of linkage, if any, between debriefing styles and underlying learning theories

In this work, we chose to address the issue of briefing methodology and its impact on subsequent clinical and behavioral performance. The decision to conduct the simulation sessions back-to-back was driven in large part by the structure of the C-STARS program and a limited ability to reassemble teams later for reassessment due to scheduling difficulties. This methodology has also been recently used in a similar study looking at the impact of debriefing styles on pediatric resuscitation performance in similar domains [22]. We compared two styles of debriefing, scripted plus-delta against an advocacy-inquiry model (DGJ). The primary outcome measures were improvement in clinical performance as assessed by a checklist (CPT) and in non-technical/behavioral performance as assessed by an anchor rated behavioral scale (BAT).

We found that the debriefing methodology did not affect subsequent performance as assessed by the CPT or BAT. Although the CPT score showed statistically significant improvement from the first to the second scenario, this increase was only one point on the scale and is felt to be clinically insignificant. It is possible that the abbreviated nature of the debriefing sessions necessitated by the schedule (12-15 minutes) did not allow adequate time to address all areas for improvement or exploration of the participants' frames of reference. Of note, there was correlation between complete novices (in-room personnel) and video reviewers when assessing +behavioral performance using the BAT. This would tend to support the use of immediate feedback tools from observers at the time a simulation exercise is completed without the need to wait for formal review, particularly in formative assessments.

Limitations of this study also need to be factored into interpretation of the results. First, it was felt that military debriefers would be best suited for the study given the student population. Two of the C-STARS staff attended a formal, weeklong simulation course at the Center for Medical Simulation in preparation for the program. After conducting a number of early debriefings, one of the debriefers was unexpectedly deployed on short notice. A replacement underwent one-on-one training with an external simulation expert at the University of Maryland School of Nursing, but the dissimilar training may have affected the quality and style of debriefing. This is reflected by a difference in the modified DASH score from the reviewers for the two primary debriefers with the individual attending the course receiving significantly higher scores ($p < 0.0001$). Interestingly, the student-modified DASH scores did not show any difference between debriefers. The student scores were also consistently higher, reflecting some bias towards higher scores.

Second, the debriefers did not switch between the scenarios. This may have accounted for the linkage between simulation type (adult vs. child) noted for the BAT and CPT scores. This could also be accounted for by the debriefer difference noted above, although there was not statistical significance found when this was examined through analysis of covariance.

Finally, the skill of the video debriefing reviewers ranged from expert (formal debriefing/simulation training with years of experience) to novice (short-term training related to the project). This variability may also account for an inability to determine differences that might be present if only expert reviewers were available to participate. This limitation is important to consider, since most training programs around the country do not have sufficient experts to conduct debriefings and must rely on less experienced personnel.



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## 7.0 CONCLUSIONS

The objectives of the study have been met as outlined by Tasks 1-3. The C-STARS Baltimore program and STC have access to a state-of-the-art simulation center with the capability to perform detailed assessments and experimental research evaluating the effectiveness of simulation-based education for both military preparedness and civilian training requirements. In addition, multi-patient simulations have been produced and integrated into the C-STARS training platform.

We have also examined the ability of different debriefing styles to alter short-term performance improvement. Given the straightforward nature of the PD debriefing style, its ease of execution, and its structure of addressing positive and negative components with the use of a checklist, it may be the preferred method in simulations with a primary clinical focus such as trauma resuscitation. While DGJ allows for more exploration of behaviors contributing to actions, it also appears to require more training and may skip over technical or procedural faults.

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# APPENDIX A

## Multi-Patient Scenarios



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# Multi-Patient Scenario #1-Mixed Medical/Surgical Unit

Background

Team is tasked with providing support in a mixed medical/surgical unit supporting deployed operations. Following a brief orientation to their environment, they will receive their first patient.

Learning Objectives

Given multiple patients requiring acute care intervention, adult human patient simulators, a facilitator, and the required medical equipment needed to treat these patients, C-STARS students/rotators should be able to correctly apply the required critical thinking and readiness skills needed to stabilize these patients without error, IAW required ATLS and ACLS protocols and JTTS Clinical Practice Guidelines by:

LO1 – Prioritizing patient care
LO2 – Managing team coordination
LO3 – Effectively assigning team assets
LO4 – Performing reassessments as indicated
LO5 – Communicating effectively in a multi-patient scenario
LO6 – Providing appropriate clinical care (see individual patient scenarios)

Length

Preparation: 35 minutes
Simulation: 35 minutes
Debrief: 40 minutes
Evaluation: 10 minutes
**Total:** 2 hours

Simulator Preparation

See individual scenarios for specific preparation of environment, supplies, and simulators.

Personnel Needed/required

| | |
|---|---|
| Physician | 1 |
| Nurse | 2-3 |
| Technicians | 3-4 |



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## SIMULATION FLOW AND EXPECTED INTERVENTIONS

| **State 1 "Adult PostOp Penetrating Abdominal Trauma"-First Patient** | |
|---|---|
| **Patient Presentation** | **Expected Interventions** |
| Team is tasked with evaluating a patient who has just arrived from the operating room following an exploratory laparotomy (Adult PostOp Penetrating Abdominal Trauma). See specific scenario for appropriate patient responses and management. | Team will evaluate patient and initiate appropriate therapy. |
| **Expected Behaviors** | |
| Team leader will assign roles and monitor team performance. Team leader may become actively involved in patient care as indicated based on team composition and need for interventions. | |

| **State 2 "Adult Acute Asthma"-Second Patient** | |
|---|---|
| **Patient Presentation** | **Expected Interventions** |
| Shortly after completion of initial evaluation of first patient, the team will receive a second patient with shortness of breath (Adult Acute Asthma). See specific scenario for appropriate patient responses and management. Second Patient's condition will continue to deteriorate requiring intubation for management of acute asthma. | Team will evaluate patient and initiate appropriate therapy.<br><br>Team will continue to reevaluate First Patient. |
| **Expected Orders** | |
| Team leader will reassign roles and monitor team performance. Team leader should continue to monitor care of both patients. | |

| **State 3 "Adult PostOp Penetrating Abdominal Trauma"** | |
|---|---|
| **Patient Presentation** | **Expected Interventions** |
| First Patient will begin to deteriorate secondary to ongoing blood loss necessitating transfusion and requirement for operative reexploration. This should occur during active airway management of Second Patient. | Team will initiate resuscitation of First Patient and continue to appropriately manage Second Patient.<br><br>Team will coordinate care of both patients. |
| **Expected Behaviors** | |
| Team leader will monitor both patients. Effective communication and resource management will be demonstrated by team and team leader. | |



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**Team Resource Management**

- Establish a leader
- Delegate appropriately
- Brief, clear, specific, and timely communications
- Maintain Situational Awareness
- Assign Roles and Responsibilities
- Empower Team members
- Advocate for patient
- SBAR, call-out, handoff



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# Simulated Clinical Encounter (SCE)
# Adult Male with Penetrating Abdominal Trauma
# Dismounted Rocket Propelled Grenade Attack

Background

*Demographics*
30 y/o, 88kg male, U.S. Army, Sergeant, Squad Leader.

*Injury Pattern*
Open abdominal wound with evisceration, multiple fragment wounds abdomen.

*Field Care (role I)*
Eviscerated bowel was replaced back into belly and covered with dressing, medic reports no LOC, pain 8/10. Patient was complaining of being thirsty and given water via canteen. Antibiotics given (Moxifloxacin 400 mg PO). Patient started to present S/S shock, Ruggedized IV started 500 ml hextend given. Hyperthermia management via HPMK and MEDEVAC via DUSTOFF.

*Initial Role II Care*
Patient stabilized and prepped for exploratory laparotomy. Given 4 Units of RBCs, 4 Units of FFPs prior to OR.

Intraoperative Report:
EBL1500cc
Transfused 8/8/0
Small bowel repair
Splenectomy
Messenteric artery repair

Learning Objectives

Given a 20-minute adult trauma patient simulation scenario who is suffering from Abdominal trauma with evisceration, an adult human patient simulator, a facilitator, and the required medical equipment needed to treat this patient, C-STARS students/rotators should be able to correctly apply the required critical thinking and readiness skills needed to stabilize this patient without error, IAW required ATLS and ACLS protocols and JTTS Clinical Practice Guidelines by:

- LO1 - Applying monitors to the patient without error
- LO2 - Performing a primary survey within 3 minutes of post-op admission and perform a secondary survey within 7 minutes of admission
- LO3 - Applying required oxygen therapy without error
- LO4 - Managing the patients airway while maintaining C-Spine alignment without compromising the airway or cervical spine (as needed)



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LO5 - Properly managing the patient's circulation
LO6 - Correctly monitor level of conscious
LO7 - Correctly evaluate/treat abdominal injury according to JTTS Clinical Practice Guidelines without error
LO8 - Correctly selecting/applying IV therapy and adjusting fluid resuscitation based on patient's lab values
LO9 - Calculating the correct dose/administration of infection, analgesia, sedation, and paralytic medication IAW Advanced Trauma Life Support and Advanced Cardiac Life Support
LO10 - Requesting/interpret appropriate radiography of head, upper extremities, chest, abdominal, pelvic lower extremities, and serum blood work
LO11 - Identify need alteration in patient condition and take appropriate steps based on local protocols and/or ATLS

Length

Preparation: 20 minutes
Simulation: 20 minutes
Debrief: 40 minutes
Evaluation: 10 minutes
**Total:** 1.5 hours

Simulator Preparation

SimMan 3G with gown

*Moulage*

- Bruising abdomen
- IV RIGHT arm
- Foley

Clinical Practice Guidelines
JTTS Flow Sheet

Personnel Needed/required

Physician 1
Nurse 1-2
Technicians 2-3

RSVs (by AFSC)

**46N/J/E Nurse**

Nursing assessment

A. Patient care assessment

Implementing Patient Care

A. Airway management/basic cardiac life support



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B. Intravenous (IV) therapy
C. Tube/catheter management
D. Blood/urine specimen collection and waived testing
E. Blood/blood component administration

Patient Care Management

A. Wound management
B. Traumatic injury management
C. Pressure monitoring lines
D. Emergency resuscitation of patients
E. Medication administration

**44E3, Emergency Services Physician**

Trauma and critical care management

A. Trauma management
B. Critical care management

Emergency procedures

A. Secures patient's airway
B. Establishes advanced intravenous access

**44M3X, Internist**

Emergency procedures

A. Secures patient's airway
B. Obtain Intravenous (IV) Access

**42G3, Physician Assistant**

No applicable RSVs

**48X3, Flight Surgeon**

No applicable RSVs

**4N0X1X, 4N0X1C IDMT, 4N0X1 SEI 487**

Fundamentals of Nursing Care

A. Patient assessment
B. Calculate, prepare, and administer medications
C. Initiate, regulate, monitor, and discontinue peripheral intravenous therapy

Nursing care of patients with special needs

A. Establish, maintain, and remove closed urinary drainage system

Nursing care of patients in emergency situations

A. Measure and record intake and output



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## SIMULATION FLOW AND EXPECTED INTERVENTIONS

| **State 1 "Post Op"** | |
|---|---|
| **Patient Presentation** | **Expected Interventions** |
| Vital Signs:<br>BP: 105/84<br>HR: 125<br>RR: 16 via BVM<br>$SPO_2$: 96 (BVM)<br><br>Cardiac Rhythm: Sinus tachycardia<br>Heart Sounds: Normal<br>Breath Sounds: Normal<br>Bowel Sounds: Absent<br>Diaphoresis: None<br>Cyanosis: None<br>Pupil: PERRLA<br><br>LOC:<br>Sedated but arousable<br>Patient on Diprivan drip<br><br>Facilitator Input (if required)<br><br>Temp: 35.0 C<br><br>Ex Lap performed and wound vac placed, approx. 3" x 5"<br><br>Minimal blood in vac<br><br>All other fragments removed<br><br>All other superficial "peppering" wounds washed out | *Airway*<br>• Assess airway<br>• Assure adequate airway with NP/OP/ETT – wean off mechanical ventilation as tolerated<br>• C-Spine precautions (as needed)<br><br>*Breathing*<br>• Assess breathing<br>• Administer oxygen based on neuro status<br>• Chest tube as needed<br><br>*Circulation*<br>• Attach monitors<br>• Gain IV access (as needed)<br>• Continued IV fluid/blood resuscitation as needed<br><br>*Disability*<br>• Wean sedation per protocol<br><br>Post-op monitoring |
| **Expected Orders** | |
| Maintain airway; follow post-op instructions, repeat labs; monitor fluid input/output. | |



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| State 2 | |
|---|---|
| **Patient Presentation** | **Expected Interventions** |
| Vital Signs:<br>BP: 82/59<br>HR: 145<br>RR: 28 ventilated<br>$SPO_2$: 99 ($O_2$) ventilated<br><br>Cardiac Rhythm: Sinus tachycardia<br>Heart Sounds: Normal<br>Breath Sounds: Normal<br>Bowel Sounds: Absent<br>Diaphoresis: None<br>Cyanosis: Pale<br><br>LOC: Increased anxiety<br><br>Facilitator Input (if required)<br><br>Skin cool to touch<br><br>Temp: 35.8 C<br><br>FAST positive for splenic injury<br><br>500 mL blood in vac | • Correctly interpret radiography & CT results (as needed)<br><br>• Identify increased sanguineous blood in wound vac system<br><br>• Identify abnormal lab work<br><br>• Consider/administer blood/FFP/platelets<br><br>• Monitor patient temperature<br><br>• Call provider and give OR report<br><br>• Insert and assess placement of OG/NG tube (as needed)<br><br>• Monitor urinary drainage system<br><br>• Prepare for transport back to OR |
| **Expected Orders** | |
| Appropriate wound care; repeat labs; continue monitoring patient, consult with surgeon for treatment, deliver report, send to OR. | |
| **Lab Work** | |
| HCT: 18 Hgb: 7 pH: 7.21<br>$PCO_2$: 30 $PaO_2$: 56<br>Ca+: 2 Lactate: 10.0 PT: 14 INR: 2.2 | |



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**Simulator/Simulation Lab Orientation**

- Orient students to simulator capabilities
- Orient students to simulation work area
- Describe participant expectations
- Emphasize “sense of urgency”
- Emphasize team concept

**Team Resource Management**

- Establish a leader
- Delegate appropriately
- Brief, clear, specific, and timely communications
- Maintain Situational Awareness
- Assign Roles and Responsibilities
- Empower Team members
- Advocate for patient
- SBAR, call-out, handoff



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**Monitor Data**

| | | | | | |
|---|---|---|---|---|---|
| ☐ Art Line | ☒ Capnography | ☐ CVP | ☒ ECG | ☒ $EtCO_2$ | ☐ MAP |
| ☒ NIBP | ☐ PA Catheter | ☒ RR | ☒ $SpO_2$ | ☒ Temp | Other: |

**Equipment**

☐ Patient

☐ IV Pump (w/ primary sets)

☐ Suction (w/ tubing and canister)

☐ Propaq EL206 (w/ accessories)

☐ O2 Source

☐ Portable ventilator (w/ circuit)

☐ Defibrillator

☐ BVM

☐ ET Tube (7.5mm)

☐ Stylet

☐ Syringe 10cc

☐ Non-rebreather mask

☐ Laryngoscope (w/ appropriate sized blade)

☐ Thomas ET Tube Holder

☐ Miscellaneous 1st line ACLS drugs (RFID)

☐ Mannitol (RFID)

☐ C-collar

☐ SAM Splint

☐ Backboard

☐ 4x4s

☐ Kerlix

☐ Chest tube drainage system

☐ 20 Ga 1.25” IV catheters



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☐ 14 Ga 3.25” IV catheters

☐ IV start kit

☐ IV training arm

☐ Alcohol wipes

☐ Foley kit

☐ HPMK

☐ 0.9% NS

☐ 3% NS

☐ LR

☐ Blood Products

☐ Pen light

☐ JTTS Trauma Flow Sheets



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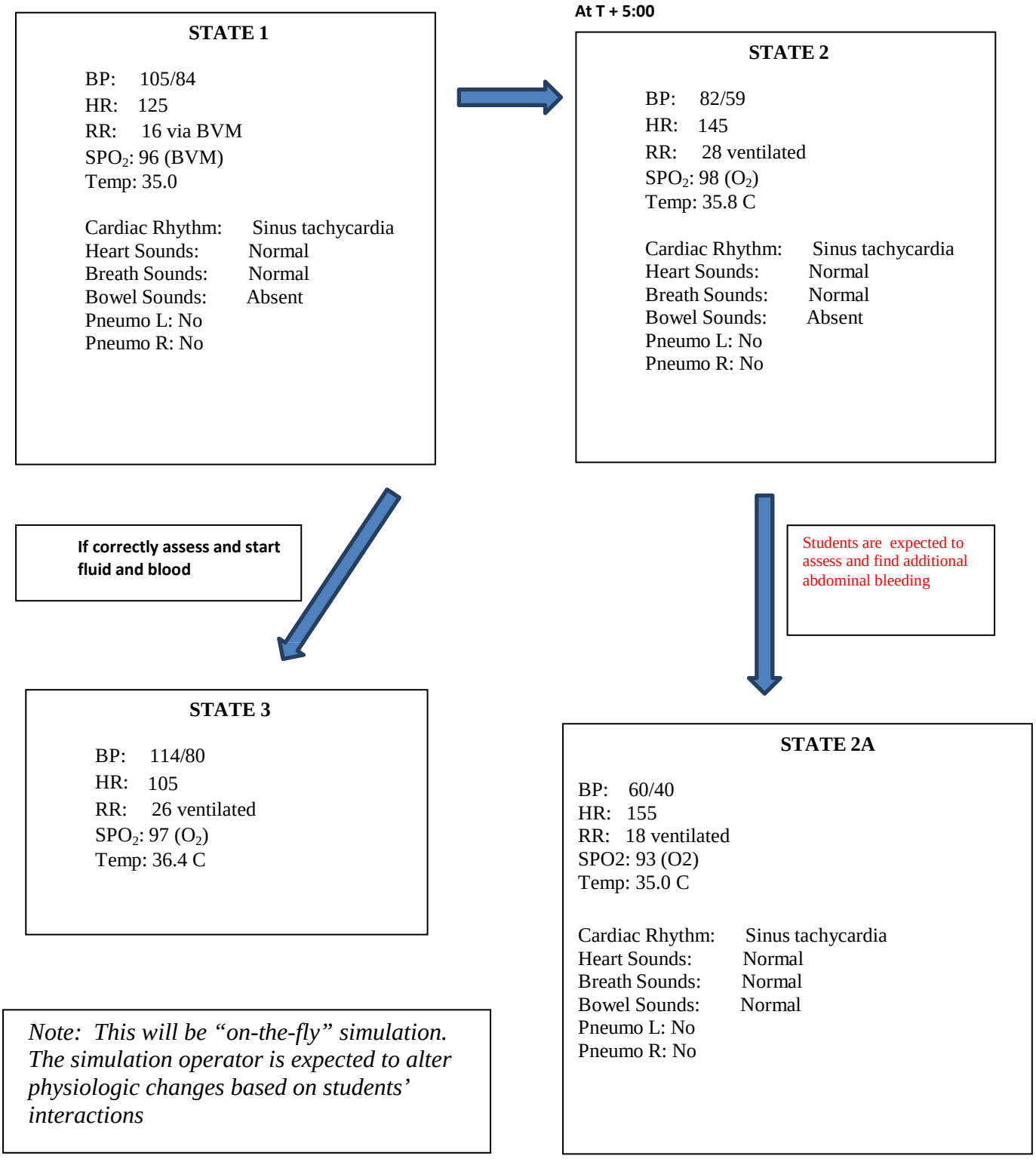
## SIMULATION OPERATOR EXPECTED FLOW



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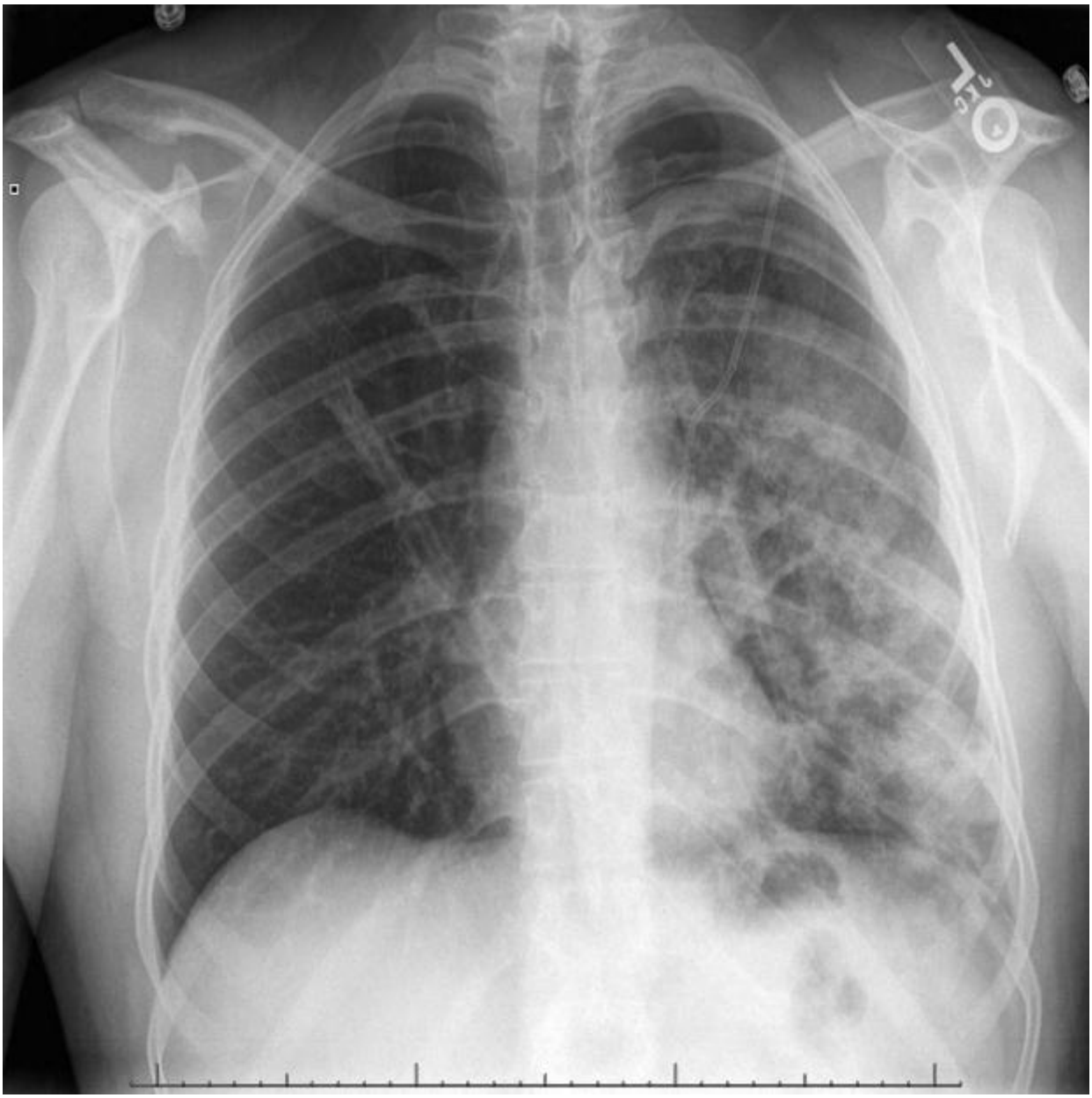
Adult Pre Intubation
CXR



Adult Post Intubation
CXR



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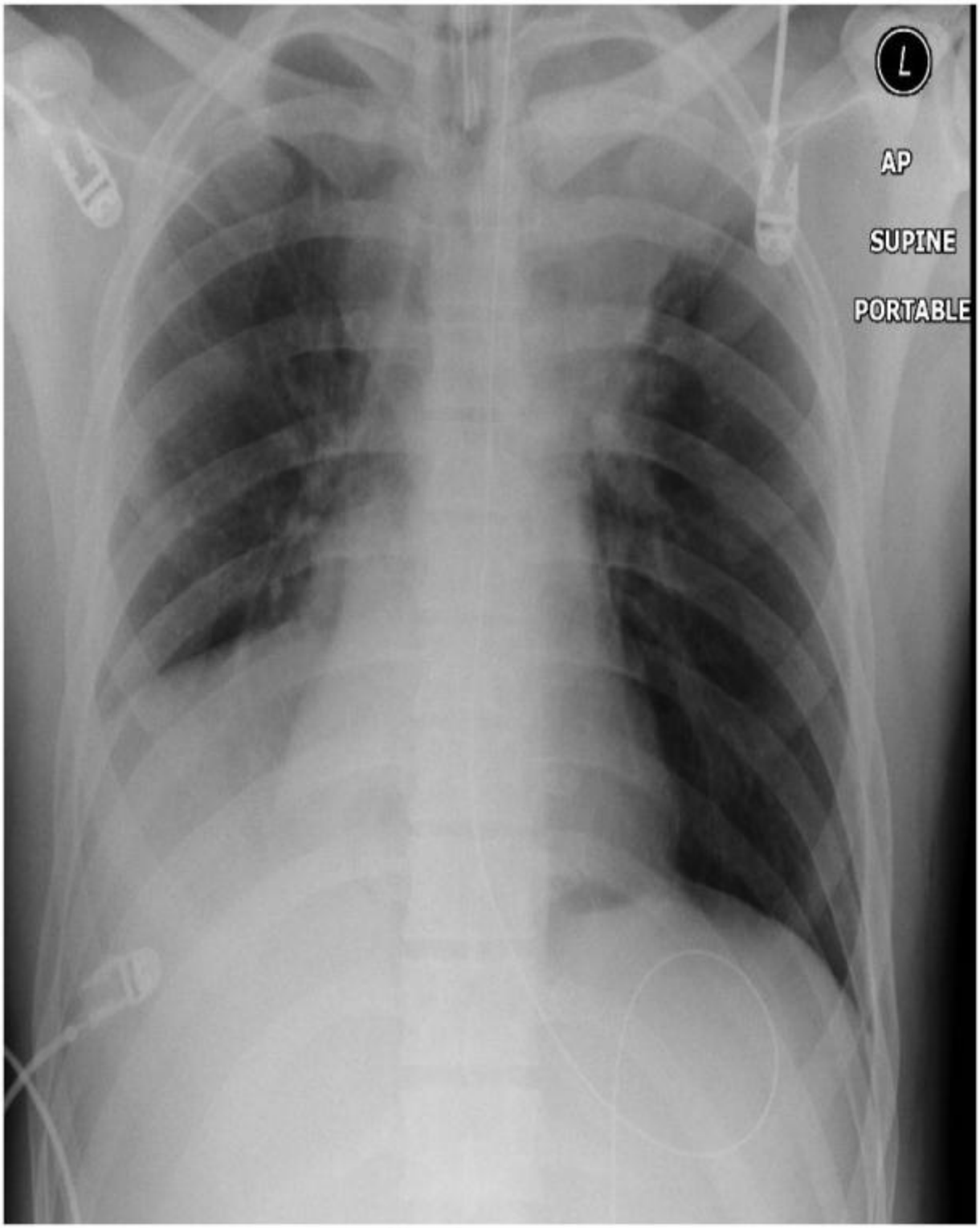


Plain Abdominal Film-Penetrating Injury



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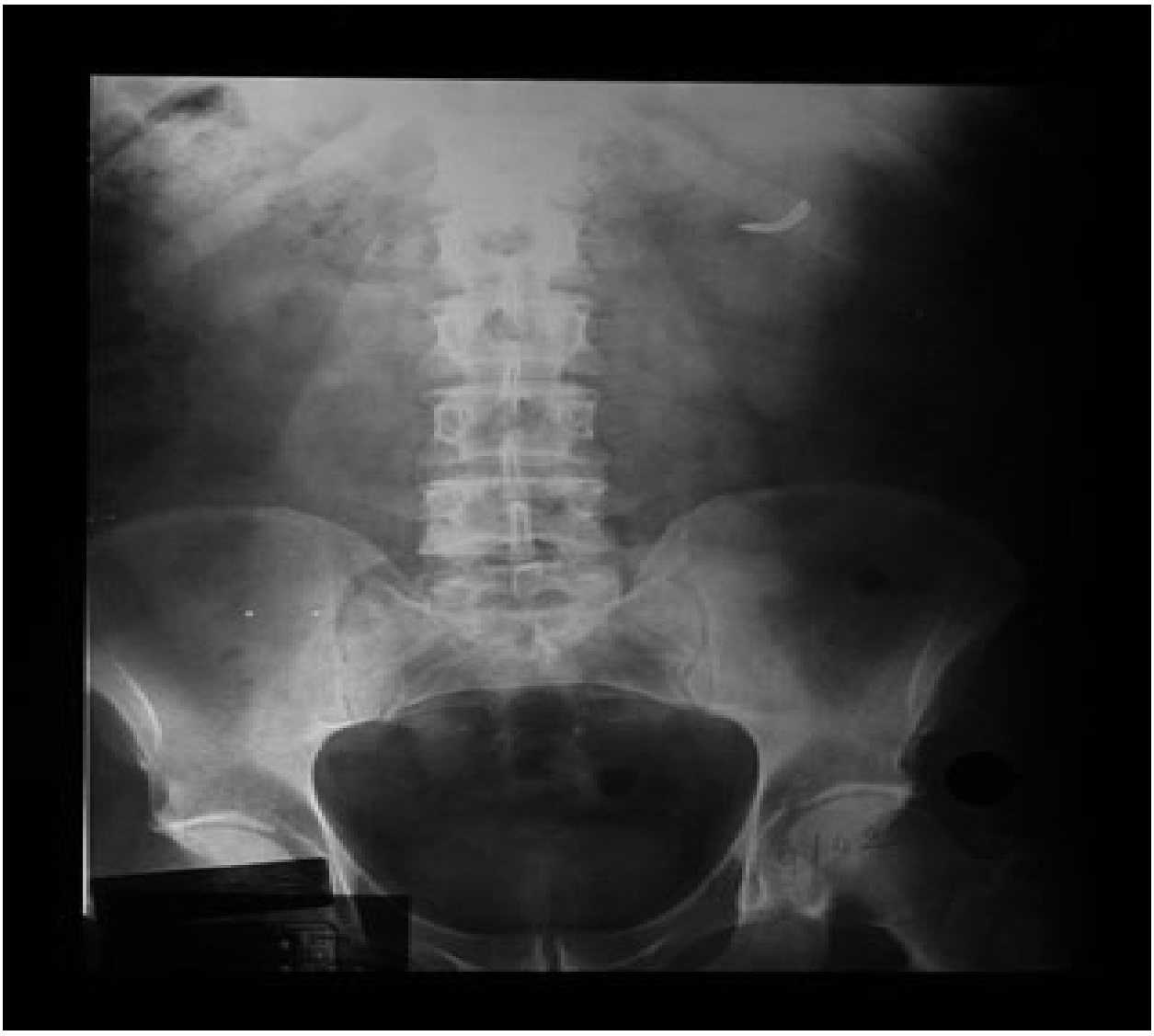



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# Admission Labs

**CBC & Coags**

- Hgb: 7
- HCT: 18
- Plt: 70,000
- WBC: 15,000
- INR: 2.2
- PT: 14
- PTT: 50

**ABG**

- $CO_2$: 30
- $PaO_2$: 56
- $HCO_3$: 17
- Lactate: 10
- pH: 7.21



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# Follow-up Labs

## CBC & Coags

- Hgb: 11
- HCT: 30
- Plt: 70,000
- WBC: 15,000
- INR: 1.1
- PT: 20
- PTT: 50

## ABG

- $CO_2$: 35
- $PaO_2$: 80
- $HCO_3$: 24
- Lactate: 3
- pH: 7.33

References:

JTTR Clinical Practice Guidelines - Battle Non-Battle Injury Documentation Record
JTTR Clinical Practice Guidelines – Management of War Wounds

Scenario created by: Keith A. Beaulieu, MBA
ICF International



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# Simulated Clinical Encounter (SCE)
# Adult Male Acute Onset Asthma Attack

Background

*Demographics*
26 y/o, 65kg male, U.S. Air Force, Staff Sergeant

*Injury Pattern*
Difficulty Breathing.

*Report from the medic* ***(READ TO STUDENTS)***
Presented to medic with difficulty breathing. Patient was out for a run around the perimeter at Bagram AB. Patient states increased difficulty breathing over the last 15 minutes or so. No history of asthma or other breathing difficulties. No current medications other than std Malaria meds. Patient presents on the side of the road, sitting, having a difficult time breathing. Medics noticed pursed lips, provided O2 via non-rebreather mask (15 L/min) and transported to your facility. Patient ate breakfast as normal, and has been hydrating all morning, is a non-smoker with no known drug allergies. Patient denies any performance enhancers or herbal use. BP – 110/68, P 124, R –28 shallow, and sweating from exercise. Patient states he never lost consciousness but complains of a tight chest and dizzy. Speaking in 1-2 word sentences and is alert, anxious, pale and diaphoretic.

Bystander just saw him on side of road and called emergency response. He did not lose consciousness while waiting for emergency care.

Learning Objectives

Given a 20-minute adult patient simulation scenario who is suffering from acute episode of asthma, an adult human patient simulator, a facilitator, and the required medical equipment needed to treat this patient, C-STARS students/rotators should be able to correctly apply the required critical thinking and readiness skills needed to stabilize this patient without error, IAW required ATLS and ACLS protocols and JTTS Clinical Practice Guidelines by:

- LO1 - Applying monitors to the patient without error
- LO2 - Performing a primary survey within 3 minutes of post-op admission and perform a secondary survey within 7 minutes of admission
- LO3 - Applying required oxygen therapy without error
- LO4 - Managing the patients airway while maintaining C-Spine alignment without compromising the airway or cervical spine (as needed)
- LO5 - Properly managing the patient's circulation
- LO6 - Correctly monitor level of conscious



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LO7 - Correctly evaluate/treat difficulty breathing according to ACLS, PHTLS, ATLS, ATCN protocols
LO8 - Correctly selecting/applying IV therapy and adjusting fluid resuscitation based on patient's lab values
LO9 - Calculating the correct dose/administration of IAW Advanced Trauma Life Support and Advanced Cardiac Life Support
LO10 - Requesting/interpret appropriate radiography of chest and serum blood work
LO11 - Identify need alteration in patient condition and take appropriate steps based on local protocols and/or ATLS

Length

Preparation: 20 minutes
Simulation: 20 minutes
Debrief: 40 minutes
Evaluation: 10 minutes
**Total:** 1.5 hours

Simulator Preparation

SimMan 3G running shorts with t-shirt

*Moulage*

- None

Clinical Practice Guidelines
JTTS Flow Sheet

Personnel Needed/required

Physician 1
Nurse 1-2
Technicians 2-3

RSVs (by AFSC)

**46N/J/E Nurse**

Nursing assessment
A. Patient care assessment
Implementing Patient Care
A. Airway management/basic cardiac life support
B. Intravenous (IV) therapy
C. Tube/catheter management
D. Blood/urine specimen collection and waived testing
E. Blood/blood component administration
Patient Care Management
A. Wound management



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B. Traumatic injury management
C. Pressure monitoring lines
D. Emergency resuscitation of patients
E. Medication administration

**44E3, Emergency Services Physician**

Trauma and critical care management

A. Trauma management
B. Critical care management

Emergency procedures

A. Secures patient's airway
B. Establishes advanced intravenous access

**44M3X, Internist**

Emergency procedures

A. Secures patient's airway
B. Obtain Intravenous (IV) Access

**42G3, Physician Assistant**

No applicable RSVs

**48X3, Flight Surgeon**

No applicable RSVs

**4N0X1X, 4N0X1C IDMT, 4N0X1 SEI 487**

Fundamentals of Nursing Care

A. Patient assessment
B. Calculate, prepare, and administer medications
C. Initiate, regulate, monitor, and discontinue peripheral Intravenous therapy

Nursing care of patients with special needs

A. Establish, maintain, and remove closed urinary drainage system

Nursing care of patients in emergency situations

A. Measure and record intake and output



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## SIMULATION FLOW AND EXPECTED INTERVENTIONS

| **State 1 ~~"Post Op"~~** | |
|---|---|
| **Patient Presentation** | **Expected Interventions** |
| Vital Signs:<br>BP: 148/88<br>HR: 128<br>RR: 30<br>$SPO_2$: 87 Nasal Cannula<br><br>Cardiac Rhythm: Sinus tachycardia<br>Heart Sounds: Normal<br>Breath Sounds: Wheezing in all fields<br>Bowel Sounds: Normal<br>Diaphoresis: None<br>Cyanosis: None<br>Pupil: PERRLA<br><br>LOC:<br>GCS 15<br>• Eyes – 4 Spontaneous<br>• Verbal – 5 Oriented<br>• Motors – 6 Obeys Commands | *Airway*<br>• Assess airway<br>• Assure adequate airway with NP/OP/ETT – wean off mechanical ventilation as tolerated<br>• C-Spine precautions (as needed)<br><br>*Breathing*<br>• Assess breathing<br>• Administer oxygen based on neuro status<br>• Chest tube as needed<br><br>*Circulation*<br>• Attach monitors<br>• Gain IV access (as needed)<br>• Continued IV fluid/blood resuscitation as needed<br><br>Obtain a history<br>• SAMPLE |
| **Expected Orders** | |
| O2 therapy, Abuterol/atrovent nebulizer, ABG, Venous sample | |



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| State 2 | |
|---|---|
| **Patient Presentation** | **Expected Interventions** |
| Vital Signs:<br>BP: 149/88<br>HR: 132<br>RR: 33<br>$SPO_2$: 88<br><br>Cardiac Rhythm: Sinus tachycardia<br>Heart Sounds: Normal<br>Breath Sounds: Wheezing in all fields<br>Bowel Sounds: Normal<br>Diaphoresis: None<br>Cyanosis: None<br>Pupil: PERRLA<br><br>GCS 15<br>• Eyes – 4 Spontaneous<br>• Verbal – 5 Oriented<br>• Motors – 6 Obeys Commands | |
| **Expected Orders** | |
| O2 therapy, Abuterol/atrovent nebulizer, ABG, Venous sample, intubate, ipratropium (Solu-medrol). | |
| **Lab Work** | |
| See lab work | |



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**Simulator/Simulation Lab Orientation**

- Orient students to simulator capabilities
- Orient students to simulation work area
- Describe participant expectations
- Emphasize “sense of urgency”
- Emphasize team concept

**Team Resource Management**

- Establish a leader
- Delegate appropriately
- Brief, clear, specific, and timely communications
- Maintain Situational Awareness
- Assign Roles and Responsibilities
- Empower Team members
- Advocate for patient
- SBAR, call-out, handoff



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**Monitor Data**

| | | | | | |
|---|---|---|---|---|---|
| ☐ Art Line | ☒ Capnography | ☐ CVP | ☒ ECG | ☒ $EtCO_2$ | ☐ MAP |
| ☒ NIBP | ☐ PA Catheter | ☒ RR | ☒ $SpO_2$ | ☒ Temp | Other: |

**Equipment**

☐ Patient

☐ IV Pump (w/ primary sets)

☐ Suction (w/ tubing and canister)

☐ Propaq EL206 (w/ accessories)

☐ O2 Source

☐ Portable ventilator (w/ circuit)

☐ Defibrillator

☐ BVM

☐ ET Tube (7.5mm)

☐ Stylet

☐ Syringe 10cc

☐ Non-rebreather mask

☐ Laryngoscope (w/ appropriate sized blade)

☐ Thomas ET Tube Holder

☐ Miscellaneous 1st line ACLS drugs (RFID)

☐ O2 source with nebulizer

☐ C-collar

☐ SAM Splint

☐ Backboard

☐ 4x4s

☐ Kerlix

☐ Chest tube drainage system

☐ 20 Ga 1.25” IV catheters



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☐ 14 Ga 3.25” IV catheters

☐ IV start kit

☐ IV training arm

☐ Alcohol wipes

☐ Foley kit

☐ HPMK

☐ 0.9% NS

☐ 3% NS

☐ LR

☐ Blood Products

☐ Pen light

☐ JTTS Trauma Flow Sheets

**ABG #1**

Time : 12:33 PM

Oxygen flow : 6.0 L/min
pH (7.34-7.46) : 7.24
HCO3- (22-26) : 26.9 mEq/L
Base excess (+/- 2) : -2.3
PCO2 (33-46) : 73.6 mmHg
PO2 (75-100) : 60.4 mmHg
SaO2 (> 95) : 89%
Lactate (0-1) : 2.4 mM
HCT (0.4-0.45) : 0.45 mEq/L
K+ (3.6-4.6) : 4.1 mEq/L
Na+ (133-143) : 135 mEq/L
Cl- (60-100) : 97.9 mEq/L
Ca++ (4.4-5.9) : 6.1 mg/dL
Glucose (70-110) : 81.6 mg/dL
Hb (10.0-14.5) : 14.84 g/dL
CO-Hb (< 3) : 0.00%



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**ABG #2**

Time : 12:41 PM

| | |
|---|---|
| Oxygen flow | : 15.0 L/min |
| pH (7.34-7.46) | : 7.23 |
| HCO3- (22-26) | : 25.9 mEq/L |
| Base excess (+/- 2) | : -2.4 |
| PCO2 (33-46) | : 70.0 mmHg |
| PO2 (75-100) | : 59.2 mmHg |
| SaO2 (> 95) | : 89% Lactate |
| (0-1) | : 2.4 mM HCT |
| (0.4-0.45) | : 0.44 mEq/L |
| K+ (3.6-4.6) | : 3.9 mEq/L |
| Na+ (133-143) | : 135 mEq/L |
| Cl- (60-100) | : 98.3 mEq/L |
| Ca++ (4.4-5.9) | : 6.1 mg/dL |
| Glucose (70-110) | : 84.8 mg/dL |
| Hb (10.0-14.5) | : 14.78 g/dL |
| CO-Hb (< 3) | : 0.00% |

**ABG #3**

Time : 12:48 PM

| | |
|---|---|
| Oxygen flow | : 15.0 L/min |
| pH (7.34-7.46) | : 7.23 |
| HCO3- (22-26) | : 25.9 mEq/L |
| Base excess (+/- 2) | : -2.4 |
| PCO2 (33-46) | : 70.0 mmHg |
| PO2 (75-100) | : 59.2 mmHg |
| SaO2 (> 95) | : 89% |
| Lactate (0-1) | : 2.4 mM |
| HCT (0.4-0.45) | : 0.44 mEq/L |
| K+ (3.6-4.6) | : 3.9 mEq/L |
| Na+ (133-143) | : 135 mEq/L |
| Cl- (60-100) | : 98.3 mEq/L |
| Ca++ (4.4-5.9) | : 6.1 mg/dL |
| Glucose (70-110) | : 84.8 mg/dL |
| Hb (10.0-14.5) | : 14.78 g/dL |
| CO-Hb (< 3) | : 0.00% |



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**Venous Labs**

Time : 12:35 PM

| | | |
|---|---|---|
| Na+ | (133-142) | : 135 mEq/L |
| K+ | (3.6-4.6) | : 3.6 mEq/L |
| Cl- | (60-100) | : 97.7 mEq/L |
| Glucose | (70-110) | : 90.1 mg/dL |
| cKMB | (< 5.5) | : 0.5 ng/mL |
| Troponin | (< 0.4) | : 0.0 ng/mL |
| Calcium, ionized | (4.4-5.9) | : 6.1 mg/dL |
| Calcium, total | (8.5-10.5) | : 10.9 mg/dL |
| Magnesium sulfate | (1.3-2.1) | : 1.4 mEq/L |
| Hb | (13.5-17.5) | : 14.96 g/dL |
| HCT | (40-45) | : 45 |
| WBC | (4-11*10^9) | : 8.2 *10^9/L |
| Platelets | (150-400*10^9) | : 279 *10^9/L |
| Activated partial thromboplastin time (APTT) | (25-40) | : 33.3 s |
| Prothrombin time (PT) | (10-13) | : 8.8 s |
| International Normalized Ratio (INR) | (0.9-1.2) | : 1.1 |



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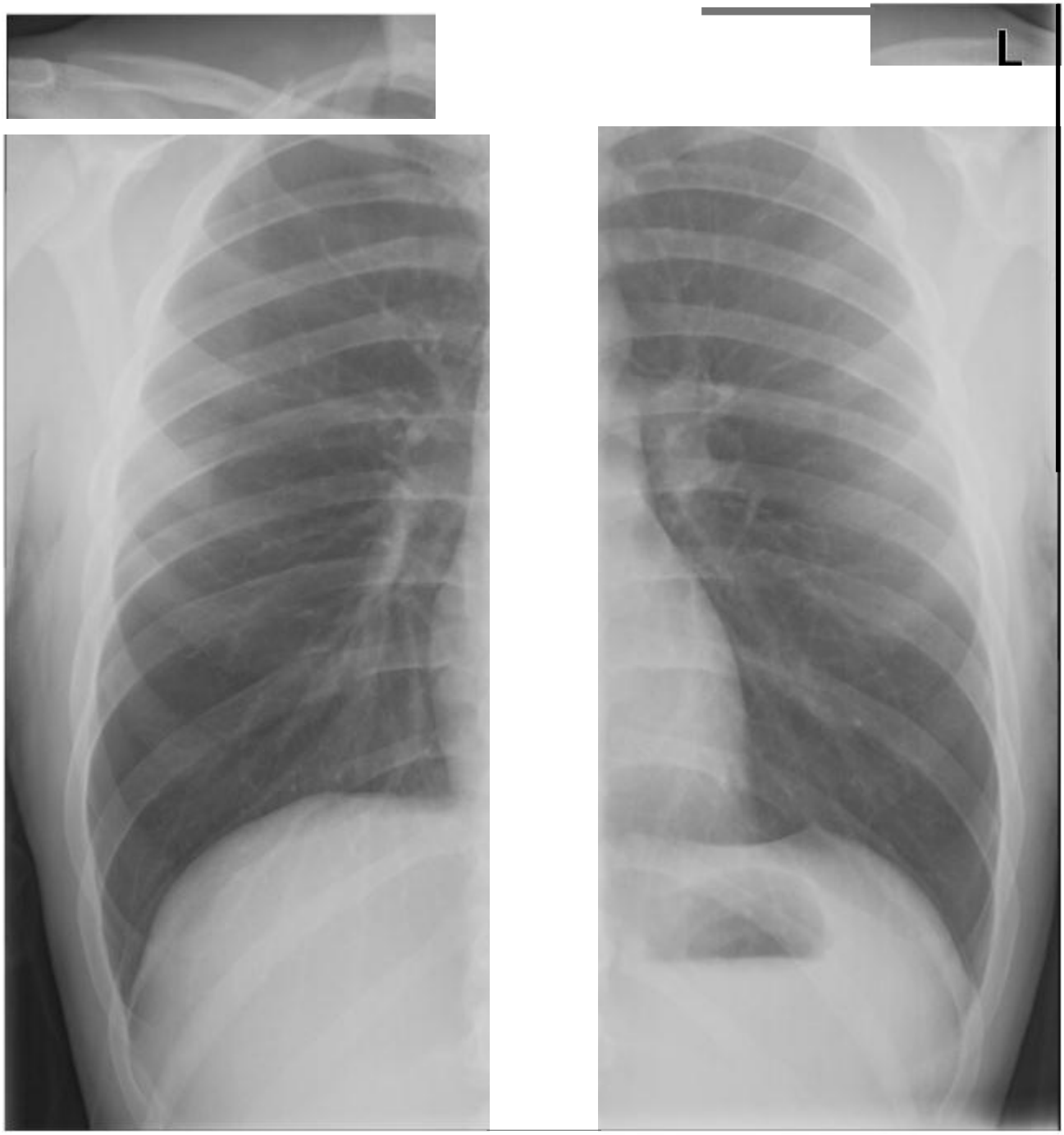




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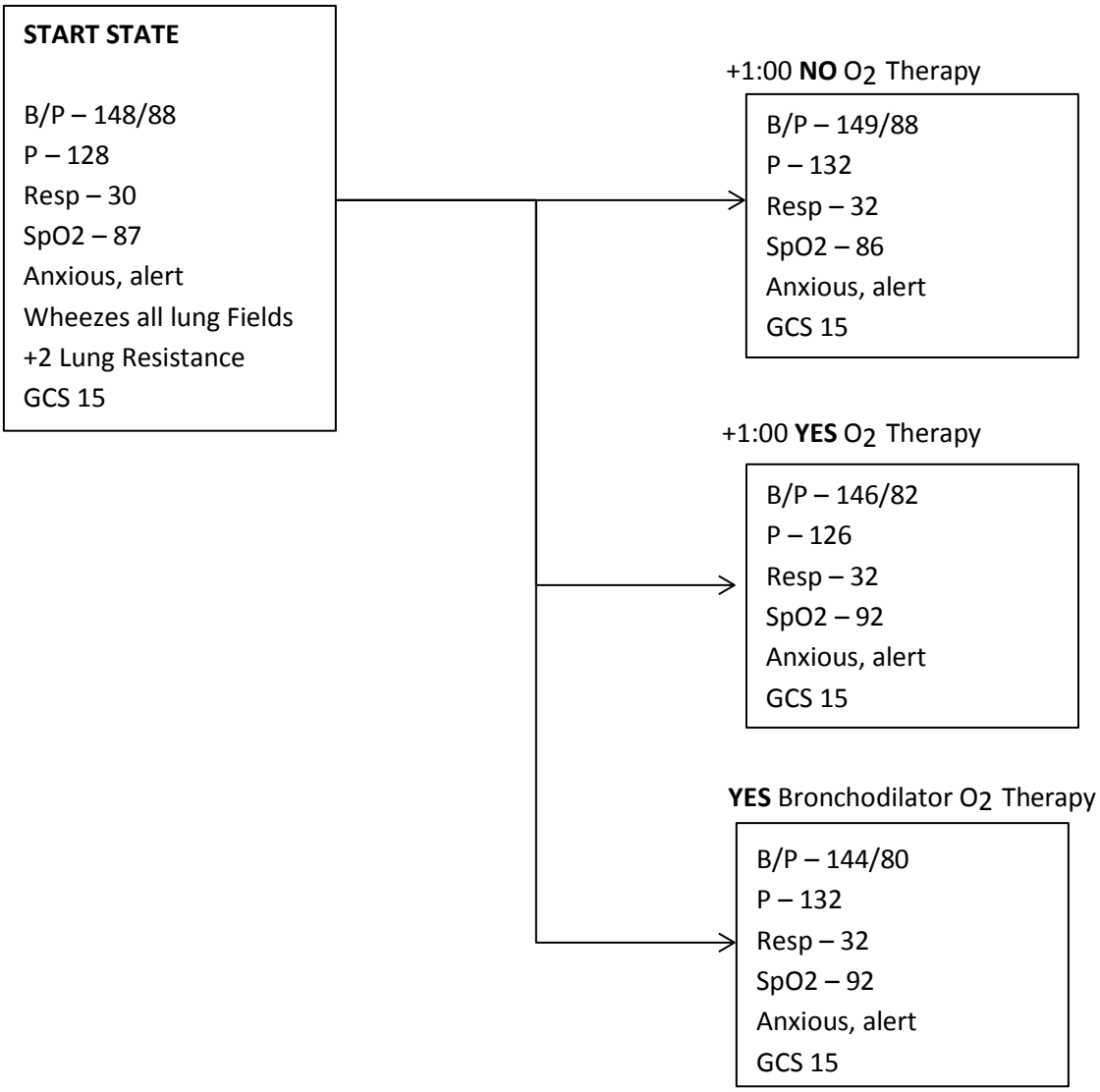
Distribution A: Approved for public release; distribution is unlimited. Case Number: 88ABW-2014-1767, 17 Apr 2014

**Simulator Stating State**

**ASTHMA – JOHN DOE Scenario (in my scenarios section)**

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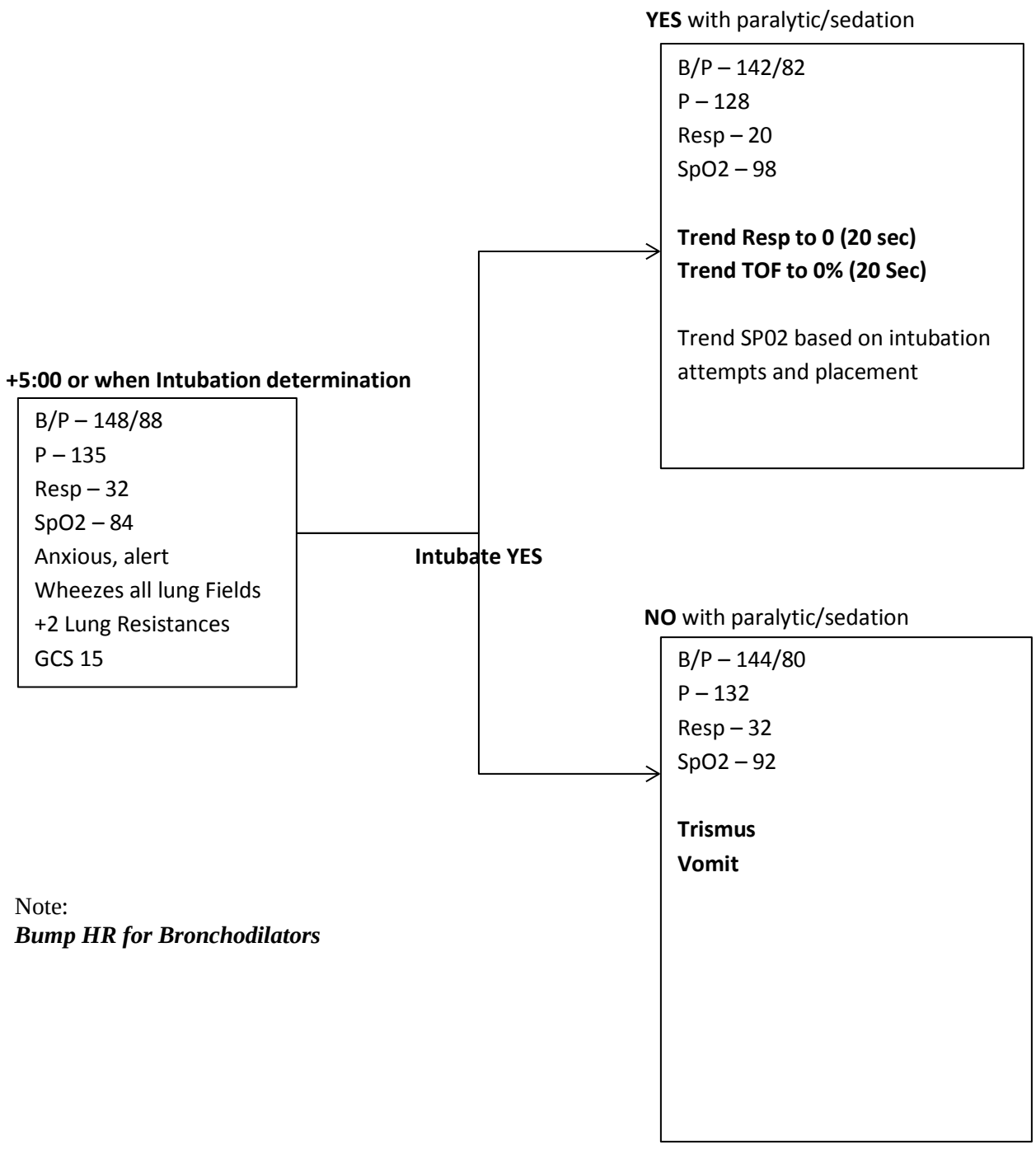


Note:
***Bump HR for Bronchodilators***



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**Voice Scripting**

Initial

| **Operator** | |
|---|---|
| START | Help, I can't breathe. |
| IF PROMPTED | My name John Doe<br>*Use 1-2 words sentences and sound like you are having trouble breathing* |

History

| **Operator** | |
|---|---|
| IF PROMPTED | **S** I can't breathe, feels like someone is sitting on my chest, I feel dizzy<br>**A** No allergies<br>**M** No medicine other than malaria meds<br>**P** Never felt like this before, no history of any breathing problems<br>**L** I drank water while I was running<br>**E** I was running on the perimeter road and I couldn't breath<br>*Use 1-2 words sentences and sound like you are having trouble breathing* |



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| | |
|---|---|
| **Operator**<br><br>IF PROMPTED | **O** I was running<br><br>**P** I can't catch my breath even if I sit<br><br>**Q** I feel like I'm suffocating, like someone is sitting on me<br><br>**R** In my chest only<br><br>**S** 6<br><br>**T** It feels like it's getting worse |

Scenario created by: Keith A. Beaulieu, MBA
ICF International



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# Multi-Patient Scenario #2-Emergency Department

Background

Team is tasked with providing support in the Emergency Department at Landstuhl Regional Medical Center to include initial evaluation of patients arriving via aeromedical evacuation. Following a brief orientation to their environment, they will receive their first patient.

Learning Objectives

Given multiple patients requiring acute care intervention, adult human patient simulators, a facilitator, and the required medical equipment needed to treat these patients, C-STARS students/rotators should be able to correctly apply the required critical thinking and readiness skills needed to stabilize these patients without error, IAW required ATLS and ACLS protocols and JTTS Clinical Practice Guidelines by:

LO1 – Prioritizing patient care
LO2 – Managing team coordination
LO3 – Effectively assigning team assets
LO4 – Performing reassessments as indicated
LO5 – Communicating effectively in a multi-patient scenario
LO6 – Providing appropriate clinical care (see individual patient scenarios)

Length

| | |
|---|---|
| Preparation: | 35 minutes |
| Simulation: | 35 minutes |
| Debrief: | 40 minutes |
| Evaluation: | 10 minutes |
| **Total:** | 2 hours |

Simulator Preparation

See individual scenarios for specific preparation of environment, supplies, and simulators.

Personnel Needed/required

| | |
|---|---|
| Physician | 1 |
| Nurse | 2-3 |
| Technicians | 3-4 |



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## SIMULATION FLOW AND EXPECTED INTERVENTIONS

| **State 1 "Chest Pain"-First Patient** | |
|---|---|
| **Patient Presentation** | **Expected Interventions** |
| Team is tasked with evaluating a patient who has been admitted to the ED with new onset chest pain (Chest Pain). See specific scenario for appropriate patient responses and management. | Team will evaluate patient and initiate appropriate therapy. |
| **Expected Behaviors** | |
| Team leader will assign roles and monitor team performance. Team leader may become actively involved in patient care as indicated based on team composition and need for interventions. | |

| **State 2 "Adult Acute Asthma"-Second Patient** | |
|---|---|
| **Patient Presentation** | **Expected Interventions** |
| During evaluation of First Patient, the team will receive a second patient arriving via aeromedical evacuation with an abbreviated history that is experiencing shortness of breath and chest pain that developed on transfer to the hospital (Postoperative Pulmonary Embolism). See specific scenario for appropriate patient responses and management. Second Patient's condition will continue to deteriorate requiring intubation for management of acute hypoxemia and altered mental status. | Team will evaluate patient and initiate appropriate therapy.<br><br>Team will continue to reevaluate First Patient. |
| **Expected Orders** | |
| Team leader will reassign roles and monitor team performance. Team leader should continue to monitor care of both patients. | |

| **State 3 "Adult PostOp Penetrating Abdominal Trauma"** | |
|---|---|
| **Patient Presentation** | **Expected Interventions** |
| First Patient will continue to have crushing substernal chest pain and will require transfer to a facility with percutaneous coronary intervention capabilities. Patient's symptoms will continue to evolve during management of Second Patient. | Team will initiate resuscitation of First Patient and continue to appropriately manage Second Patient.<br><br>Team will coordinate care of both patients. |
| **Expected Behaviors** | |
| Team leader will monitor both patients. Effective communication and resource management will be demonstrated by team and team leader. | |



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**Team Resource Management**

- Establish a leader
- Delegate appropriately
- Brief, clear, specific, and timely communications
- Maintain Situational Awareness
- Assign Roles and Responsibilities
- Empower Team members
- Advocate for patient
- SBAR, call-out, handoff



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# Simulated Clinical Encounter (SCE)
## Adult, Acute Chest Pain

Background

*Demographics: Patient is a 55-y/o male who presents to the ER, via ambulance, with severe retrosternal chest pain and dyspnea x 1 hr. He noticed the chest pain after shoveling snow for 15 minutes. He stopped shoveling snow and the pain continued. He is moderately obese, does not exercise, uses EtOH frequently and has a 35-year hx of tobacco use.*

Learning Objectives

Given a 20-minute adult patient simulation scenario who is suffering from new onset chest pain, an adult human patient simulator, a facilitator, and the required medical equipment needed to treat this patient, C-STARS students/rotators should be able to correctly apply the required critical thinking and readiness skills needed to stabilize this patient without error, IAW required ATLS and ACLS protocols and JTTS Clinical Practice Guidelines by:

- LO1 - Applying monitors to the patient without error
- LO2 - Performing a primary survey within 3 minutes of post-op admission and perform a secondary survey within 7 minutes of admission
- LO3 - Applying required oxygen therapy without error
- LO4 - Managing the patients airway (as needed)
- LO5 - Properly managing the patient's circulation
- LO6 - Correctly monitor level of conscious
- LO7 - Correctly evaluate/treat difficulty breathing according to ACLS protocols
- LO8 - Correctly selecting/ applying IV therapy and adjusting fluid resuscitation based on patient's lab values
- LO9 - Calculating the correct dose/administration of IAW Advanced Cardiac Life Support
- LO10 - Requesting/interpret appropriate radiography of chest and serum blood work
- LO11 - Identify need alteration in patient condition and take appropriate steps based on local protocols

Length

Preparation: 20 minutes



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Simulation: 20 minutes
Debrief: 40 minutes
Evaluation: 10 minutes
**Total:** 1.5 hours

Simulator Preparation

SimMan 3G running shorts with t-shirt

*Moulage*

- None

Personnel Needed/required

| | |
|---|---|
| Physician | 1 |
| Nurse | 1-2 |
| Technicians | 2-3 |

RSVs (by AFSC)

**46N/J/E Nurse**

Nursing assessment

A. Patient care assessment

Implementing Patient Care

A. Airway management/basic cardiac life support
B. Intravenous (IV) therapy
C. Tube/catheter management
D. Blood/urine specimen collection and waived testing
E. Blood/blood component administration

Patient Care Management

A. Emergency resuscitation of patients
B. Medication administration

**44E3, Emergency Services Physician**

Trauma and critical care management

A. Critical care management

Emergency procedures

A. Secures patient's airway
B. Establishes advanced intravenous access

**44M3X, Internist**

Emergency procedures

A. Secures patient's airway
B. Obtain Intravenous (IV) Access

**42G3, Physician Assistant**

No applicable RSVs



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**48X3, Flight Surgeon**

No applicable RSVs

**4N0X1X, 4N0X1C IDMT, 4N0X1 SEI 487**

Fundamentals of Nursing Care

A. Patient assessment
B. Calculate, prepare, and administer medications
C. Initiate, regulate, monitor, and discontinue peripheral Intravenous therapy

Nursing care of patients in emergency situations

A. Measure and record intake and output



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## SIMULATION FLOW AND EXPECTED INTERVENTIONS

<table>
<tr><th colspan="2">State 1 “Presentation to ER”</th></tr>
<tr><th>Patient Presentation</th><th>Expected Interventions</th></tr>
<tr><td>Vital Signs:<br>BP: 150/110<br>HR: 100<br>RR: 16<br>SPO2 : 90<br><br>Cardiac Rhythm: Sinus tach w/ LBBB<br>Heart Sounds: wnl<br>Breath Sounds: wnl<br>Bowel Sounds: present x4<br>Diaphoresis: Profuse<br>Cyanosis: none<br>Pupil: 4mm, ERL<br><br>LOC:<br>GCS 15<br>• Eyes – 4 Spontaneous<br>• Verbal – 5 Oriented<br>• Motors – 6 Obeys Commands</td><td>Airway<br>• Assess airway<br>• Assure adequate airway, if necessary, with NP/OP/ETT<br>• C-Spine precautions (as needed)<br><br>Breathing<br>• Assess breathing<br>• Administer oxygen based on SPO2 status<br><br>Circulation<br>• Attach monitors<br>• Gain IV access x2<br>• Draw blood for analysis of cardiac enzymes<br><br>Obtain a history<br>• Pt. c/o “crushing” retrosternal pain, nausea, dyspnea for the past hour. Onset of pain was sudden after a period of brief physical activity, (snow shoveling).<br>• Pt. reports several prior, brief episodes of chest pain which resolved w/ cessation of exercise<br>• Pt. is moderately obese, (Ht.=68”, Wt.=250 lb), and has not been tested for diabetes<br>• Pt. reports a history of tobacco use, (1-2 packs/day), x 35 yr w/ cessation 5 yr ago<br>• Pt. reports an “unhealthy lifestyle” w/ infrequent exercise<br>• Pt. reports occasional/frequent EtOH use</td></tr>
<tr><th colspan="2">Expected Orders</th></tr>
<tr><td colspan="2"></td></tr>
</table>



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| **State 2** | |
|---|---|
| **Patient Presentation** | **Expected Interventions** |
| Vital Signs:<br>BP: 120/90<br>HR: 85<br>RR: 1<br>$SPO_2$: 98<br><br>Cardiac Rhythm: NSR w/LBBB<br>Heart Sounds:<br>Breath Sounds:<br>Bowel Sounds:<br>Diaphoresis: mild<br>Cyanosis: none<br>Pupil: PERL<br><br>LOC:<br>GCS 15<br>• Eyes – 4 Spontaneous<br>• Verbal – 5 Oriented<br>• Motors – 6 Obeys Commands | Obtain initial 12-lead EKG and evaluate for abnormalities, (incl. ST-segment elevation, heart block, bundle-branch block)<br><br>Compare EKG to previous EKGs, if available<br><br>Attach nasal cannula and deliver O2 @ 3-4 L/min<br><br>Give patient 300 mg ASA and ask pt to chew and swallow ASA Give sublingual NTG<br><br>Give morphine IV for pain, 2-5 mg, Q5-15 min, as needed<br><br>Consider giving Clopidogrel, (600 mg if pt is going to cath lab for PCI. 300 mg if not)<br><br>Schedule patient for immediate coronary angiography and possible PCI. |
| **Expected Orders** | |
| | |
| **Lab Work** | |
| CBC w/ Cardiac enzymes. | |



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**Simulator/Simulation Lab Orientation**

- Orient students to simulator capabilities
- Orient students to simulation work area
- Describe participant expectations
- Emphasize “sense of urgency”
- Emphasize team concept

**Team Resource Management**

- Establish a leader
- Delegate appropriately
- Brief, clear, specific, and timely communications
- Maintain Situational Awareness
- Assign Roles and Responsibilities
- Empower Team members
- Advocate for patient
- SBAR, call-out, handoff



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**Monitor Data**

| | | | | | |
|---|---|---|---|---|---|
| ☐ Art Line | ☒ Capnography | ☐ CVP | ☒ ECG | ☒ $EtCO_2$ | ☐ MAP |
| ☒ NIBP | ☐ PA Catheter | ☒ RR | ☒ $SpO_2$ | ☒ Temp | Other: |

**Equipment**

☐ Patient

☐ IV Pump (w/ primary sets)

☐ Suction (w/ tubing and canister)

☐ Propaq EL206 (w/ accessories)

☐ O2 Source

☐ Portable ventilator (w/ circuit)

☐ Defibrillator

☐ BVM

☐ ET Tube (7.5mm)

☐ Stylet

☐ Syringe 10cc

☐ Non-rebreather mask

☐ Laryngoscope (w/ appropriate sized blade)

☐ Thomas ET Tube Holder

☐ Miscellaneous 1st line ACLS drugs (RFID)

☐ O2 source with nebulizer

☐ C-collar

☐ SAM Splint

☐ Backboard

☐ 4x4s

☐ Kerlix

☐ Chest tube drainage system



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☐ 20 Ga 1.25” IV catheters

☐ 14 Ga 3.25” IV catheters

☐ IV start kit

☐ IV training arm

☐ Alcohol wipes

☐ Foley kit

☐ HPMK

☐ 0.9% NS

☐ 3% NS

☐ LR

☐ Blood Products

☐ Pen light

☐ JTTS Trauma Flow Sheets

**ABG #1**

Time : 12:33 PM

Oxygen flow : 6.0 L/min
pH (7.34-7.46) : 7.24
HCO3- (22-26) : 26.9 mEq/L
Base excess (+/- 2) : -2.3
PCO2 (33-46) : 73.6 mmHg
PO2 (75-100) : 60.4 mmHg
SaO2 (> 95) : 89%
Lactate (0-1) : 2.4 mM
HCT (0.4-0.45) : 0.45 mEq/L
K+ (3.6-4.6) : 4.1 mEq/L
Na+ (133-143) : 135 mEq/L
Cl- (60-100) : 97.9 mEq/L
Ca++ (4.4-5.9) : 6.1 mg/dL
Glucose (70-110) : 81.6 mg/dL
Hb (10.0-14.5) : 14.84 g/dL
CO-Hb (< 3) : 0.00%



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**ABG #2**

| | |
|---|---|
| Time | : 12:41 PM |
| Oxygen flow | : 15.0 L/min |
| pH (7.34-7.46) | : 7.23 |
| HCO3- (22-26) | : 25.9 mEq/L |
| Base excess (+/- 2) | : -2.4 |
| PCO2 (33-46) | : 70.0 mmHg |
| PO2 (75-100) | : 59.2 mmHg |
| SaO2 (> 95) | : 89% |
| Lactate (0-1) | : 2.4 mM |
| HCT (0.4-0.45) | : 0.44 mEq/L |
| K+ (3.6-4.6) | : 3.9 mEq/L |
| Na+ (133-143) | : 135 mEq/L |
| Cl- (60-100) | : 98.3 mEq/L |
| Ca++ (4.4-5.9) | : 6.1 mg/dL |
| Glucose (70-110) | : 84.8 mg/dL |
| Hb (10.0-14.5) | : 14.78 g/dL |
| CO-Hb (< 3) | : 0.00% |

**ABG #3**

| | |
|---|---|
| Time | : 12:48 PM |
| Oxygen flow | : 15.0 L/min |
| pH (7.34-7.46) | : 7.23 |
| HCO3- (22-26) | : 25.9 mEq/L |
| Base excess (+/- 2) | : -2.4 |
| PCO2 (33-46) | : 70.0 mmHg |
| PO2 (75-100) | : 59.2 mmHg |
| SaO2 (> 95) | : 89% |
| Lactate (0-1) | : 2.4 mM |
| HCT (0.4-0.45) | : 0.44 mEq/L |
| K+ (3.6-4.6) | : 3.9 mEq/L |
| Na+ (133-143) | : 135 mEq/L |
| Cl- (60-100) | : 98.3 mEq/L |
| Ca++ (4.4-5.9) | : 6.1 mg/dL |
| Glucose (70-110) | : 84.8 mg/dL |
| Hb (10.0-14.5) | : 14.78 g/dL |
| CO-Hb (< 3) | : 0.00% |



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**Venous Labs**

Time : 12:35 PM

| | | |
|---|---|---|
| Na+ | (133-142) | : 135 mEq/L |
| K+ | (3.6-4.6) | : 3.6 mEq/L |
| Cl- | (60-100) | : 97.7 |
| mEq/L Glucose | (70-110) | : 90.1 |
| mg/dL cKMB | (< 5.5) | : 0.5 ng/mL |
| Troponin | (< 0.4) | : 0.0 ng/mL |
| Calcium, ionized | (4.4-5.9) | : 6.1 mg/dL |
| Calcium, total | (8.5-10.5) | : 10.9 |
| mg/dL Magnesium sulfate | (1.3-2.1) | : 1.4 mEq/L |
| Hb | (13.5-17.5) | : 14.96 g/dL |
| HCT | (40-45) | : 45 |
| WBC | (4-11*10^9) | : 8.2 *10^9/L |
| Platelets | (150-400*10^9) | : 279 *10^9/L |
| Activated partial thromboplastin time (APTT) | (25-40) | : 33.3 s |
| Prothrombin time (PT) | (10-13) | : 8.8 s |
| International Normalized Ratio (INR) | (0.9-1.2) | : 1.1 |



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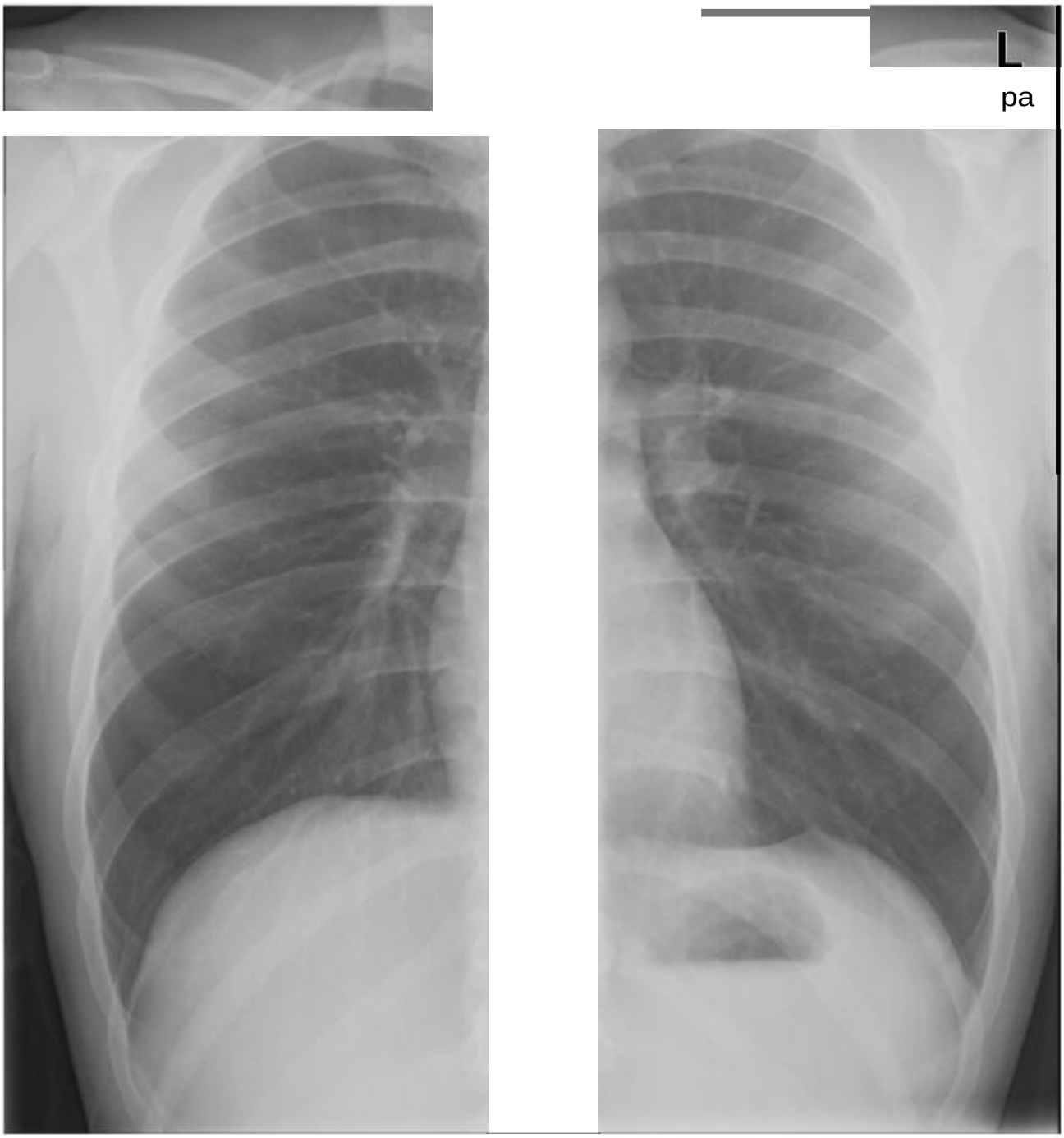




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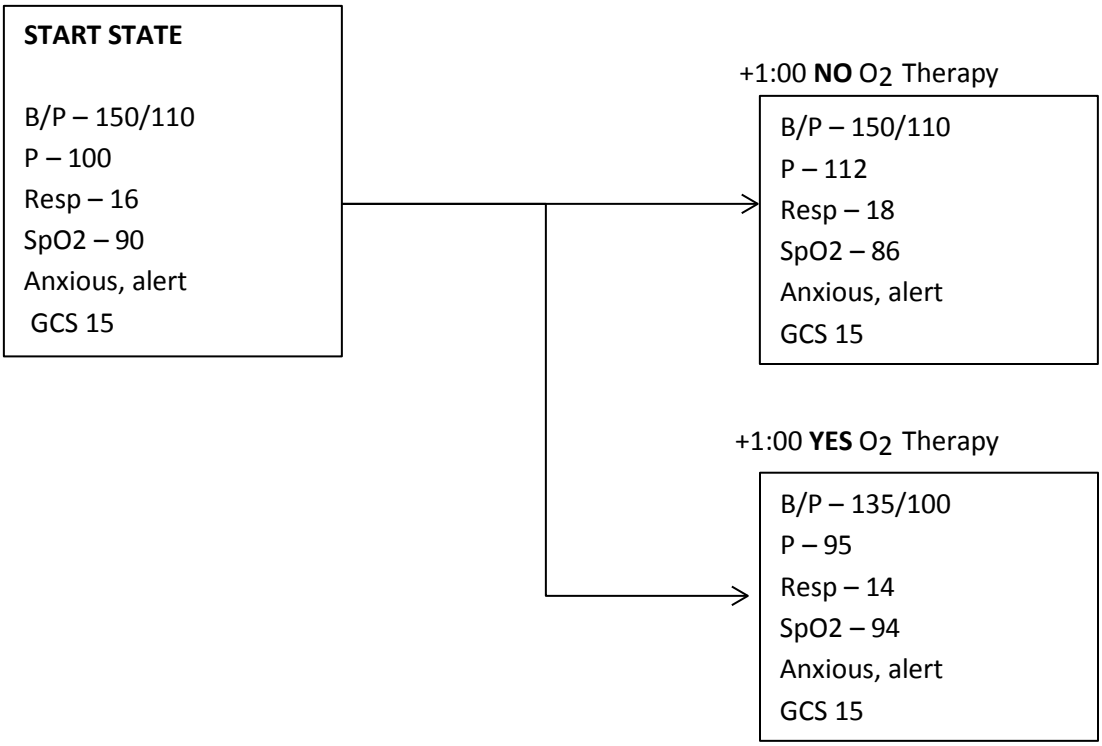
**Simulator Stating State**

**_____ Scenario**

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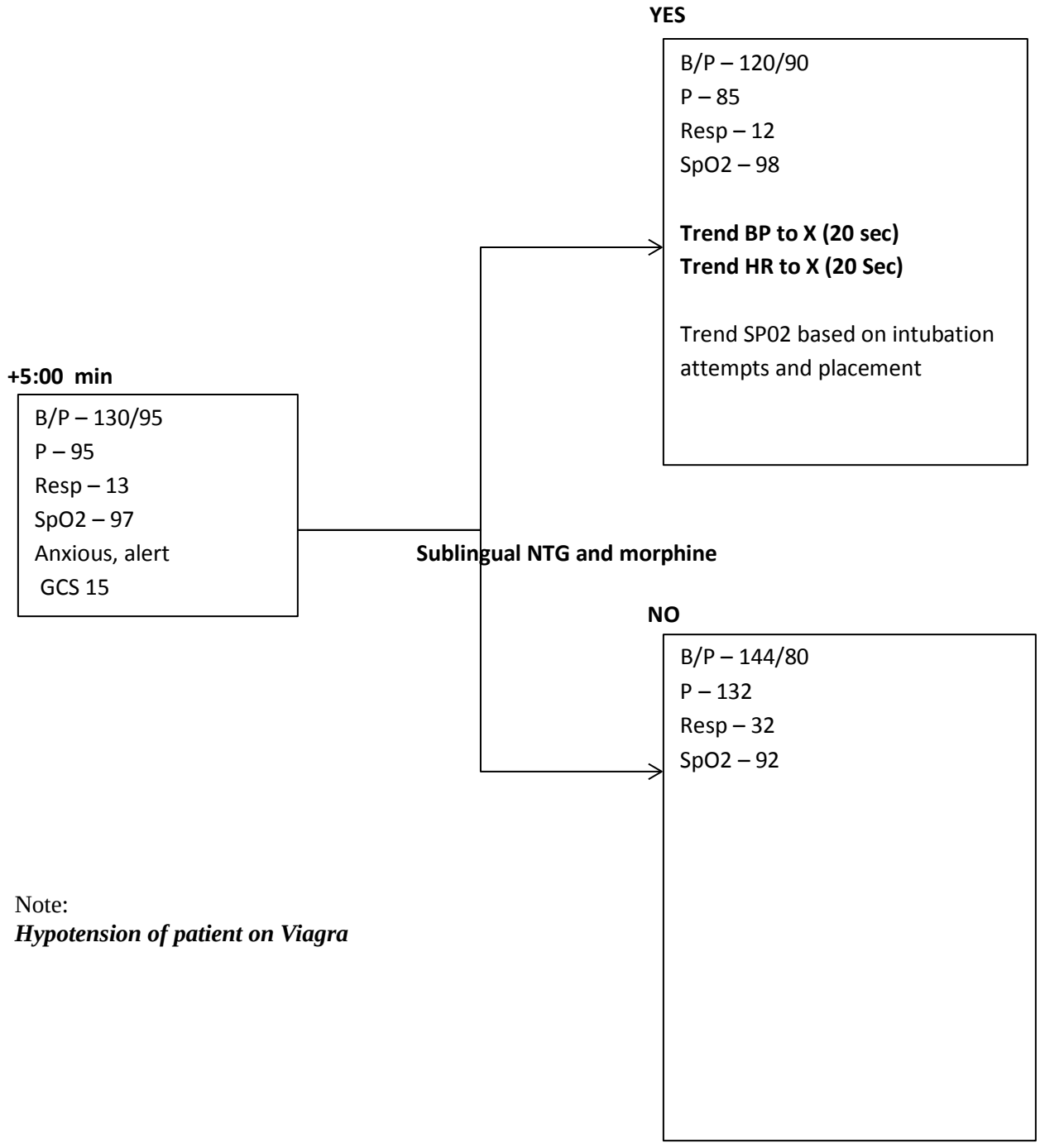


Note:
***Hypotension of patient on Viagra***



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**Voice Scripting**

Initial

| **Operator** | |
|---|---|
| START | Help me; I think I'm having a heart attack |
| IF PROMPTED | My name is John Doe |

History

| **Operator** | |
|---|---|
| IF PROMPTED | **S** I can't breathe, feels like someone is sitting on my chest<br>**A** No allergies<br>**M** No medicine other than malaria meds<br>**P** I've had some previous, brief episodes of chest pain that went away after I sat down and rested<br>**L** I drank a beer while I was shoveling snow<br>**E** I was shoveling snow from my driveway |
| **Operator** | |
| IF PROMPTED | **O** I was shoveling<br>**P** I can't catch my breath<br>**Q** I feel like I'm suffocating, like someone is sitting on me<br>**R** In my chest only<br>**S** 6<br>**T** It feels like it's getting worse |



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# Simulated Clinical Encounter (SCE)
# Adult Post-Op PE

Background

*Demographics: Patient is a 30-y/o, 100-kg male who suffered a fractured left femur in an MVC. The femur fracture was stabilized with an external fixator. Patient had to remain at Bagram for medevac to Germany and has been relatively immobile for 4 days. On post-op day 5, he was evacuated to Landstuhl. The 6-hour flight was uneventful.*

*Injury Pattern: Soon after arrival at Landstuhl, the patient complains of acute-onset dyspnea and chest pain, which is exacerbated by deep inhalation. He is sweating profusely, anxious and breathing in shallow, rapid breaths. His chest pain is greater on the right side of his chest. Patient has a cough w/ blood-tinged sputum and has visible JVD when sitting upright.*

Learning Objectives

Given a 20-minute adult patient simulation scenario who is suffering from Post-op Pulmonary Embolism, an adult human patient simulator, a facilitator, and the required medical equipment needed to treat this patient, C-STARS students/rotators should be able to correctly apply the required critical thinking and readiness skills needed to stabilize this patient without error, IAW required ATLS and ACLS protocols and JTTS Clinical Practice Guidelines by:

- LO1 - Applying monitors to the patient without error
- LO2 - Performing a primary survey within 3 minutes of post-op admission and perform a secondary survey within 7 minutes of admission
- LO3 - Applying required oxygen therapy without error
- LO4 - Managing the patients airway while maintaining C-Spine alignment without compromising the airway or cervical spine (as needed)
- LO5 - Properly managing the patient's circulation
- LO6 - Correctly monitor level of conscious
- LO7 - Correctly evaluate/treat difficulty breathing according to ACLS, PHTLS, ATLS, ATCN protocols
- LO8 - Correctly selecting/ applying IV therapy and adjusting fluid resuscitation based on patient's lab values
- LO9 - Calculating the correct dose/administration of IAW Advanced Trauma Life Support and Advanced Cardiac Life Support
- LO10 - Requesting/interpret appropriate radiography of chest and serum blood work



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LO11 - Identify need alteration in patient condition and take appropriate steps based on local protocols and/or ATLS

Length

Preparation: 20 minutes
Simulation: 20 minutes
Debrief: 40 minutes
Evaluation: 10 minutes
**Total:** 1.5 hours

Simulator Preparation

SimMan 3G, hospital gown

*Moulage*

- Hip-to-ankle cast on L. leg.

Personnel Needed/required

Physician 1
Nurse 1-2
Technicians 2-3

RSVs (by AFSC)

**46N/J/E Nurse**

Nursing assessment
A. Patient care assessment

Implementing Patient Care
A. Airway management/basic cardiac life support
B. Intravenous (IV) therapy
C. Tube/catheter management
D. Blood/urine specimen collection and waived testing
E. Blood/blood component administration

Patient Care Management
A. Wound management
B. Traumatic injury management
C. Pressure monitoring lines
D. Emergency resuscitation of patients
E. Medication administration

**44E3, Emergency Services Physician**

Trauma and critical care management
A. Trauma management
B. Critical care management

Emergency procedures
A. Secures patient's airway
B. Establishes advanced intravenous access



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**44M3X, Internist**

Emergency procedures

A. Secures patient's airway
B. Obtain Intravenous (IV) Access

**42G3, Physician Assistant**

No applicable RSVs

**48X3, Flight Surgeon**

No applicable RSVs

**4N0X1X, 4N0X1C IDMT, 4N0X1 SEI 487**

Fundamentals of Nursing Care

A. Patient assessment
B. Calculate, prepare, and administer medications
C. Initiate, regulate, monitor, and discontinue peripheral Intravenous therapy

Nursing care of patients with special needs

A. Establish, maintain, and remove closed urinary drainage system

Nursing care of patients in emergency situations

A. Measure and record intake and output



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## SIMULATION FLOW AND EXPECTED INTERVENTIONS

| **State 1 "Post Op" @ Bagram, prior to transport** | |
|---|---|
| **Patient Presentation** | **Expected Interventions** |
| Vital Signs:<br>BP: 120/92<br>HR: 72<br>RR: 14<br>$SPO_2$ : 98<br><br>Cardiac Rhythm: NSR<br>Heart Sounds: normal<br>Breath Sounds: normal<br>Bowel Sounds: present in all 4 Q<br>Diaphoresis: none<br>Cyanosis: none<br>Pupil: PERL<br><br>LOC:<br>GCS 15<br>• Eyes – 4 Spontaneous<br>• Verbal – 5 Oriented<br>• Motors – 6 Obeys Commands | *Airway*<br>• Assess airway<br>• Assure adequate airway with NP/OP/ETT -wean off mechanical ventilation as tolerated<br>• C-Spine precautions (as needed)<br><br>*Breathing*<br>• Assess breathing<br>• Administer oxygen based on neuro status<br>• Chest tube as needed<br><br>*Circulation*<br>• Attach monitors<br>• Gain IV access (as needed)<br>• Continued IV fluid/blood resuscitation as needed<br><br>*Obtain a history* |
| **Expected Orders** | |
| | |



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| State 2, Post-transport, triage in ER or admission to ICU | |
|---|---|
| **Patient Presentation** | **Expected Interventions** |
| Vital Signs:<br>BP: 90/60<br>HR: 150<br>RR: 30, shallow<br>$SPO_2$ : 85<br><br>Cardiac Rhythm: sinus tach/wide QRS<br>Heart Sounds: normal<br>Breath Sounds: diminished in RLL<br>Bowel Sounds: normal<br>Diaphoresis: profuse<br>Cyanosis: mildly<br>Pupil: PERL<br><br>LOC: Extremely anxious<br><br>GCS 15<br>• Eyes – 4 Spontaneous<br>• Verbal – 4 Becoming More Confused<br>• Motors – 6 Obeys Commands | *Airway*<br>• Assess airway<br>• Assure adequate airway<br><br>*Breathing*<br>• Assess breathing<br>• Administer oxygen<br><br>*Circulation*<br>• Attach monitors<br>• Gain 2nd IV access<br><br>*Need for CT and intervention if possible* |
| **Expected Orders** | |
| | |
| **Lab Work** | |
| See lab work (normal blood count, electrolytes and enzymes). | |



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| State 2, In ICU admission or ER | |
|---|---|
| **Patient Presentation** | **Expected Interventions** |
| Vital Signs:<br>BP: 90/60<br>HR: 150<br>RR: 30, shallow<br>SPO2 : 85<br><br>Cardiac Rhythm: sinus tach w BBB<br>Note: A deep "S wave" is present in lead V1 and a "Q wave" and inverted "T wave" are present in lead III (suggestive of right heart 'strain')<br><br>Heart Sounds: normal<br>Breath Sounds: diminished on RLL<br>Bowel Sounds:<br>Diaphoresis: profuse<br>Cyanosis: mildly<br>Pupil: PERL<br><br>LOC: Extremely anxious<br><br>GCS 14<br>• Eyes – 4 Spontaneous<br>• Verbal – 4 Becoming More Confused<br>• Motors – 6 Obeys Commands | *Airway*<br>• Assess airway<br>• Assure adequate airway<br><br>*Breathing*<br>• Assess breathing<br>• Administer oxygen 02 via 100% non-rebreather<br><br>*Circulation*<br>• Attach monitors<br>• Gain IV access (as needed)<br><br>Medicate for pain and anxiety |
| **Expected Orders** | |
| | |
| **Lab Work** | |
| See lab work | |



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**Simulator/Simulation Lab Orientation**

- Orient students to simulator capabilities
- Orient students to simulation work area
- Describe participant expectations
- Emphasize “sense of urgency”
- Emphasize team concept

**Team Resource Management**

- Establish a leader
- Delegate appropriately
- Brief, clear, specific, and timely communications
- Maintain Situational Awareness
- Assign Roles and Responsibilities
- Empower Team members
- Advocate for patient
- SBAR, call-out, handoff



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**Monitor Data**

| | | | | | |
|---|---|---|---|---|---|
| ☐ Art Line | ☒ Capnography | ☐ CVP | ☒ ECG | ☒ $EtCO_2$ | ☐ MAP |
| ☒ NIBP | ☐ PA Catheter | ☒ RR | ☒ $SpO_2$ | ☒ Temp | Other: |

**Equipment**

☐ Patient

☐ IV Pump (w/ primary sets)

☐ Suction (w/ tubing and canister)

☐ Propaq EL206 (w/ accessories)

☐ O2 Source

☐ Portable ventilator (w/ circuit)

☐ Defibrillator

☐ BVM

☐ ET Tube (7.5mm)

☐ Stylet

☐ Syringe 10cc

☐ Non-rebreather mask

☐ Laryngoscope (w/ appropriate sized blade)

☐ Thomas ET Tube Holder

☐ Miscellaneous 1st line ACLS drugs (RFID)

☐ O2 source with nebulizer

☐ C-collar

☐ SAM Splint

☐ Backboard

☐ 4x4s

☐ Kerlix

☐ Chest tube drainage system

☐ 20 Ga 1.25” IV catheters



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☐ 14 Ga 3.25” IV catheters

☐ IV start kit

☐ IV training arm

☐ Alcohol wipes

☐ Foley kit

☐ HPMK

☐ 0.9% NS

☐ 3% NS

☐ LR

☐ Blood Products

☐ Pen light

☐ JTTS Trauma Flow Sheets

**ABG #1**

Time : 12:33 PM

Oxygen flow : 6.0 L/min
pH (7.34-7.46) : 7.24
HCO3- (22-26) : 20.9 mEq/L
Base excess (+/- 2) : -3.3
PCO2 (33-46) : 73.6 mmHg
PO2 (75-100) : 60.4 mmHg
SaO2 (> 95) : 89%
Lactate (0-1) : 3.4 mM
HCT (0.4-0.45) : 0.45 mEq/L
K+ (3.6-4.6) : 4.1 mEq/L
Na+ (133-143) : 135 mEq/L
Cl- (60-100) : 97.9 mEq/L
Ca++ (4.4-5.9) : 6.1 mg/dL
Glucose (70-110) : 81.6 mg/dL
Hb (10.0-14.5) : 14.84 g/dL
CO-Hb (< 3) : 0.00%



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**ABG #2**

| | |
|---|---|
| Time | : 12:41 PM |
| Oxygen flow | : 15.0 L/min |
| pH (7.34-7.46) | : 7.23 |
| HCO3- (22-26) | : 25.9 mEq/L |
| Base excess (+/- 2) | : -2.4 |
| PCO2 (33-46) | : 70.0 mmHg |
| PO2 (75-100) | : 59.2 mmHg |
| SaO2 (> 95) | : 89% |
| Lactate (0-1) | : 2.4 mM |
| HCT (0.4-0.45) | : 0.44 mEq/L |
| K+ (3.6-4.6) | : 3.9 mEq/L |
| Na+ (133-143) | : 135 mEq/L |
| Cl- (60-100) | : 98.3 mEq/L |
| Ca++ (4.4-5.9) | : 6.1 mg/dL |
| Glucose (70-110) | : 84.8 mg/dL |
| Hb (10.0-14.5) | : 14.78 g/dL |
| CO-Hb (< 3) | : 0.00% |

**ABG #3**

| | |
|---|---|
| Time | : 12:48 PM |
| Oxygen flow | : 15.0 L/min |
| pH (7.34-7.46) | : 7.23 |
| HCO3- (22-26) | : 25.9 mEq/L |
| Base excess (+/- 2) | : -2.4 |
| PCO2 (33-46) | : 70.0 mmHg |
| PO2 (75-100) | : 59.2 mmHg |
| SaO2 (> 95) | : 89% |
| Lactate (0-1) | : 2.4 mM |
| HCT (0.4-0.45) | : 0.44 mEq/L |
| K+ (3.6-4.6) | : 3.9 mEq/L |
| Na+ (133-143) | : 135 mEq/L |
| Cl- (60-100) | : 98.3 mEq/L |
| Ca++ (4.4-5.9) | : 6.1 mg/dL |
| Glucose (70-110) | : 84.8 mg/dL |
| Hb (10.0-14.5) | : 14.78 g/dL |
| CO-Hb (< 3) | : 0.00% |



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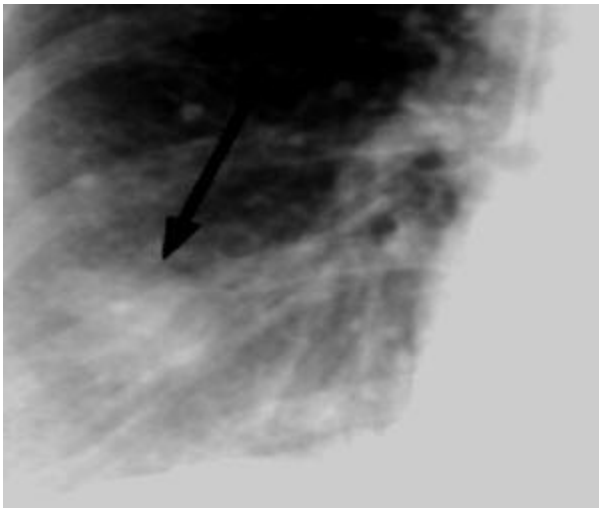
**Venous Labs**

Time : 12:35 PM

| | | |
|---|---|---|
| Na+ | (133-142) | : 135 mEq/L |
| K+ | (3.6-4.6) | : 3.6 mEq/L |
| Cl- | (60-100) | : 97.7 |
| mEq/L Glucose | (70-110) | : 90.1 |
| mg/dL cKMB | (< 5.5) | : 0.5 ng/mL |
| Troponin | (< 0.4) | : 0.0 ng/mL |
| Calcium, ionized | (4.4-5.9) | : 6.1 mg/dL |
| Calcium, total | (8.5-10.5) | : 10.9 |
| mg/dL Magnesium sulfate | (1.3-2.1) | : 1.4 mEq/L |
| Hb | (13.5-17.5) | : 14.96 g/dL |
| HCT | (40-45) | : 45 |
| WBC | (4-11*10^9) | : 8.2 *10^9/L |
| Platelets | (150-400*10^9) | : 279 *10^9/L |
| Activated partial thromboplastin time (APTT) | (25-40) | : 33.3 s |
| Prothrombin time (PT) | (10-13) | : 8.8 s |
| International Normalized Ratio (INR) | (0.9-1.2) | : 1.1 |



Close-up view of AP CXR shows pulmonary embolism in the right lung (black arrow).



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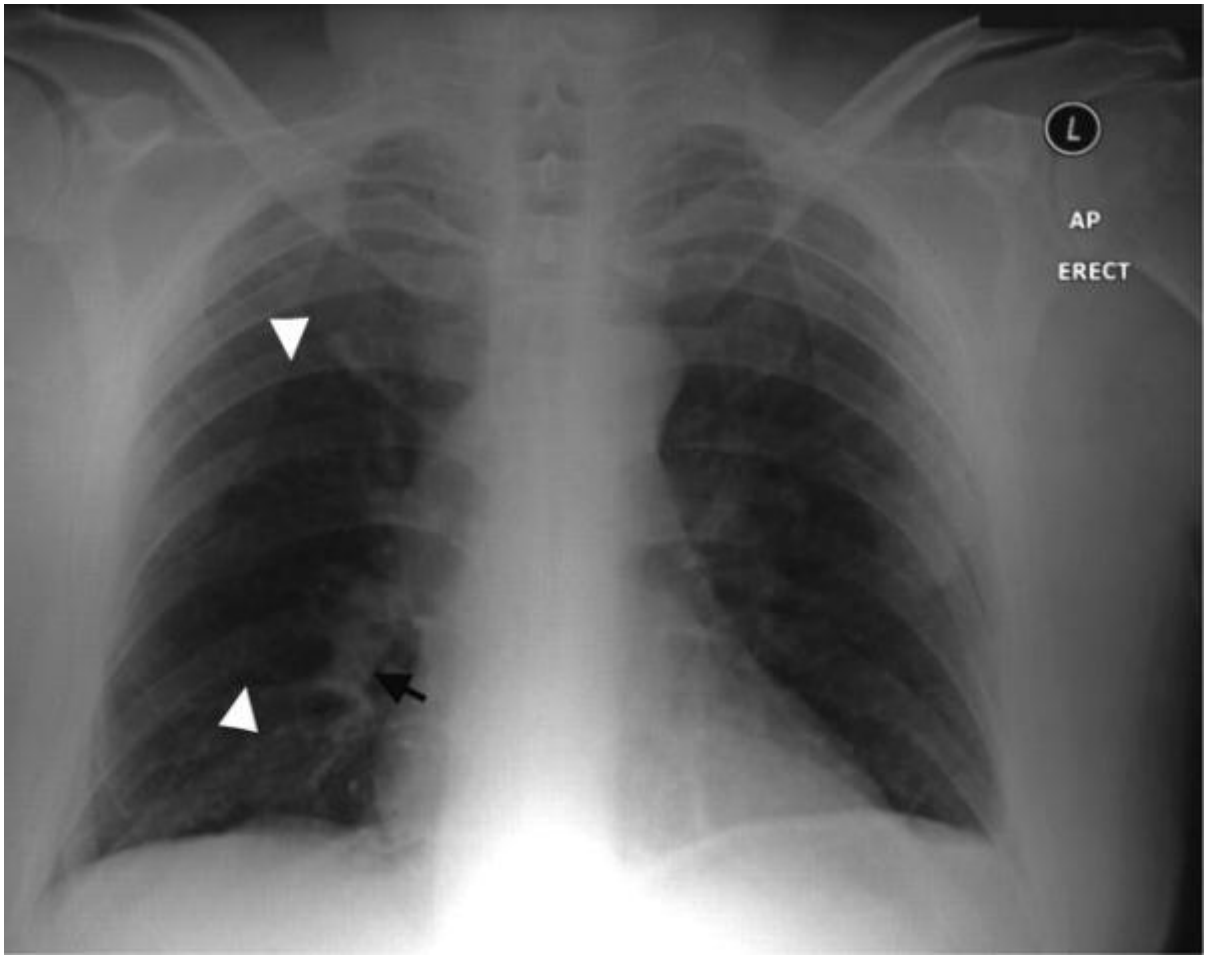


**Westermark Sign**, is a sign that represents a focus of oligemia (leading to collapse of vessel) seen distal to a pulmonary embolism (PE). Note the dilation of the pulmonary arteries proximal to the embolus and the collapse of the distal vasculature creating the appearance of a sharp cut off on chest radiography.



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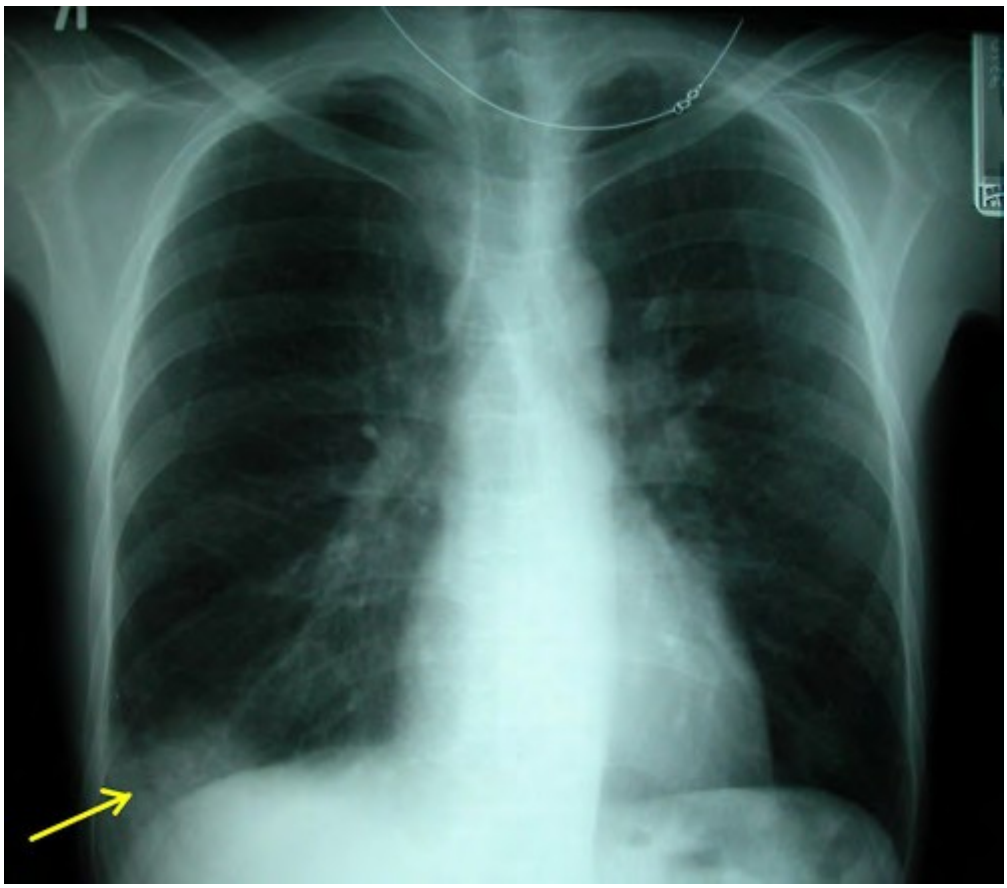

AP CXR showing “Hampton’s Hump,” an area of pulmonary infarction distal to a pulmonary embolism.



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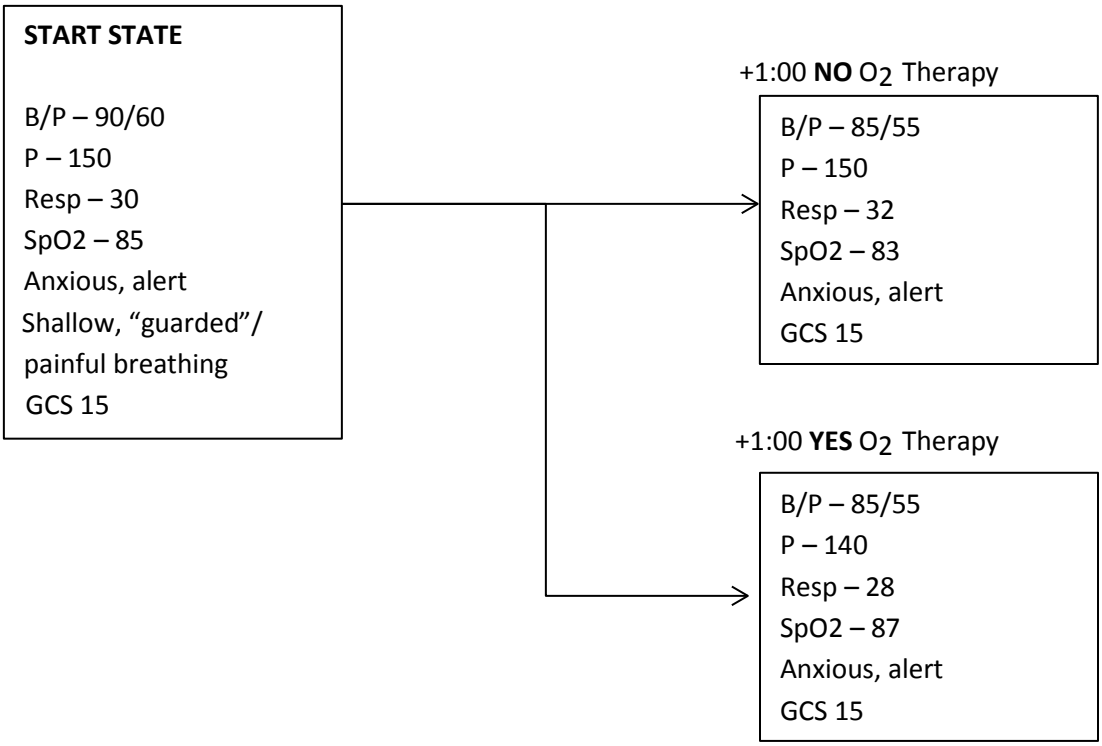
**Simulator Stating State**

**_____ Scenario**

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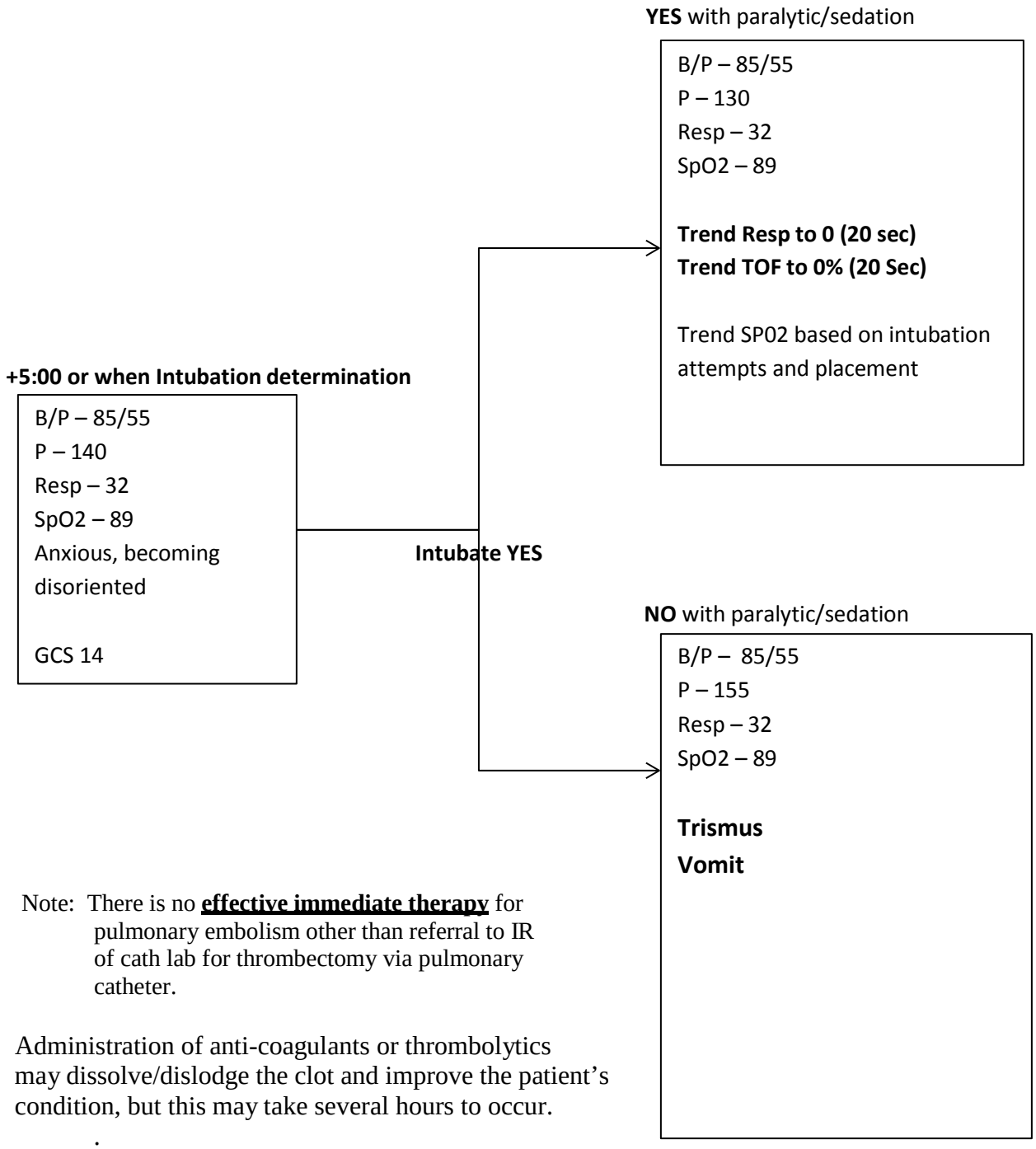


Note: There is no **effective immediate therapy** for pulmonary embolism other than referral to IR of cath lab for thrombectomy via pulmonary catheter.

Administration of anti-coagulants or thrombolytics may dissolve/dislodge the clot and improve the patient's condition, but this may take several hours to occur.

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**Voice Scripting**

Initial

| | |
|---|---|
| **Operator** | |
| START | Help, my chest hurts and it's hard to breathe! |
| IF PROMPTED | My name XXX |
| | *Cough w/ great pain, occasionally* |

History

| | |
|---|---|
| **Operator** | |
| IF PROMPTED | **S** I can't breathe. My chest hurts. I feel dizzy |
| | **A** No allergies |
| | **M** No medicine other than pain/sedation from transport. |
| | **P** Never felt like this before. It started all of a sudden |
| | **L** Nothing recently. |
| | **E** I just arrived from Bagram a few hours ago. |
| **Operator** | **O** |
| IF PROMPTED | **P** |
| | **Q** |
| | **R** |
| | **S** |
| | **T** |



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# Multi-Patient Scenario #3-Acute Trauma Management

Background

Team is tasked with providing initial trauma evaluation and resuscitation of casualties arriving from the field. Patients will arrive having received Role 1 care. Following a brief orientation to their environment, they will receive their first two patients.

Learning Objectives

Given multiple patients requiring acute care intervention, adult human patient simulators, a facilitator, and the required medical equipment needed to treat these patients, C-STARS students/rotators should be able to correctly apply the required critical thinking and readiness skills needed to stabilize these patients without error, IAW required ATLS and ACLS protocols and JTTS Clinical Practice Guidelines by:

- LO1 – Prioritizing patient care
- LO2 – Managing team coordination
- LO3 – Effectively assigning team assets
- LO4 – Performing reassessments as indicated
- LO5 – Communicating effectively in a multi-patient scenario
- LO6 – Providing appropriate clinical care (see individual patient scenarios)

Length

| | |
|---|---|
| Preparation: | 35 minutes |
| Simulation: | 50 minutes |
| Debrief: | 40 minutes |
| Evaluation: | 10 minutes |
| **Total:** | 2.25 hours |

Simulator Preparation

See individual scenarios for specific preparation of environment, supplies, and simulators.

Personnel Needed/required

| | |
|---|---|
| Physician | 1 |
| Nurse | 2-3 |
| Technicians | 3-4 |



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## SIMULATION FLOW AND EXPECTED INTERVENTIONS

| **State 1 "Adult Facial Trauma"/"Adult Penetrating Trauma with TBI and Pneumothorax"-First and Second Patients** | |
|---|---|
| **Patient Presentation** | **Expected Interventions** |
| Team is tasked with evaluating two patients arriving to their location from the same field incident with facial trauma (Adult Facial Trauma) and traumatic brain injury/pneumothorax (Adult Penetrating Trauma with TBI and Pneumothorax). See specific scenario for appropriate patient responses and management. | Team will evaluate patient and initiate appropriate therapy. |
| **Expected Behaviors** | |
| Team leader will assign roles and monitor team performance. Team leader may become actively involved in patient care as indicated based on team composition and need for interventions. | |

| **State 2 "Adult Abdominal and BLE Blast Injury"-Third Patient** | |
|---|---|
| **Patient Presentation** | **Expected Interventions** |
| During evaluation of First and Second Patient, the team will receive a third patient who was injured in an area immediately adjacent to the receiving area (Adult Abdominal and BLE Blast Injury). Third Patient is brought in on a ground sheet and will be managed on the floor due to lack of stretcher/gurney. See specific scenario for appropriate patient responses and management.<br>Second Patient's condition will require intubation for management of altered mental status, hypoxemia, and shock. | Team will evaluate patient and initiate appropriate therapy.<br><br>Team will continue to reevaluate First and Second Patient. |
| **Expected Orders** | |
| Team leader will reassign roles and monitor team performance. Team leader should continue to monitor care of both patients. | |

| **State 3 All Patients** | |
|---|---|
| **Patient Presentation** | **Expected Interventions** |
| Team leader is informed that the current patient load exceeds the local facility capabilities. | Team leader will initiate transfer protocols.<br>Team leader will prioritize patients for transfer.<br>Team will prepare patients for transfer. |
| **Expected Behaviors** | |
| Team leader will monitor both patients. Effective communication and resource management will be demonstrated by team and team leader. | |



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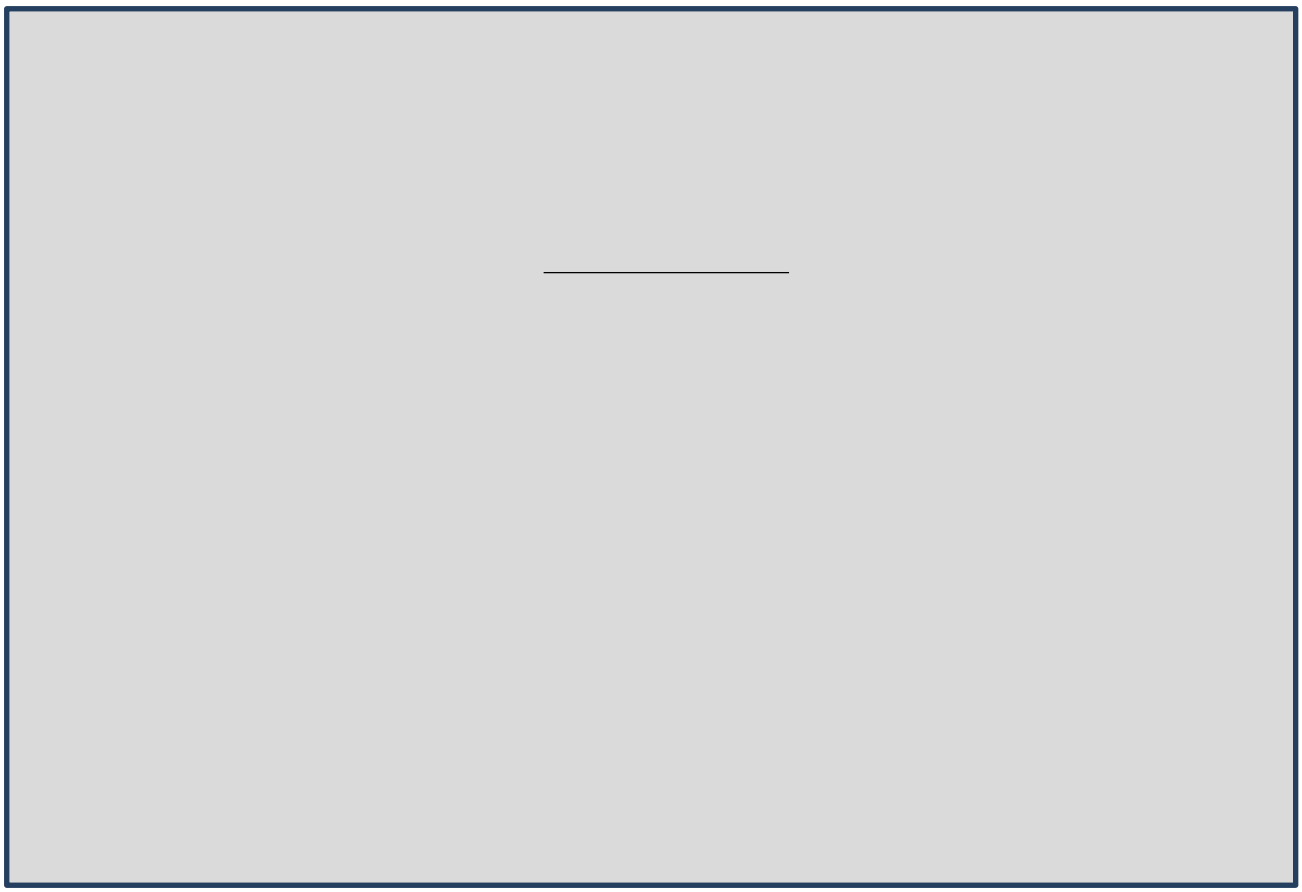

**Team Resource Management**

- Establish a leader
- Delegate appropriately
- Brief, clear, specific, and timely communications
- Maintain Situational Awareness
- Assign Roles and Responsibilities
- Empower Team members
- Advocate for patient
- SBAR, call-out, handoff



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# Simulated Clinical Encounter (SCE)
# Adult male with facial trauma
# Dismounted IED blast

Background

*Demographics*

35-y/o, 90-kg male, U.S. Marine was walking patrol behind and MRAB when the convoy was hit by and IED. He was taken to the nearest Role I facility.

*Injury Pattern*

Facial injuries to OU; OD abrasion and bruising, right zygomatic fracture, right maxilla/mandible fractures, right nare trauma with active bleeding controlled with packing.

*Field Care (Role 1)*

*Fox Shields to both eyes, packing in right nare, dressing to laceration on face, Medevac to Role II.*

Learning Objectives

Given a 20-minute adult trauma patient simulation scenario who is suffering from facial trauma, an adult human patient simulator, a facilitator, and the required medical equipment needed to treat this patient, C-STARS students/rotators should be able to correctly apply the required critical thinking and readiness skills needed to stabilize this patient without error, IAW required ATLS and ACLS protocols and JTTS Clinical Practice Guidelines by:

- LO1 - Applying monitors to the patient without error
- LO2 - Performing a primary survey within 3 minutes of admission and perform a secondary survey within 7 minutes of admission
- LO3 - Applying required oxygen therapy without error
- LO4 - Managing the patients airway while maintaining C-Spine alignment without compromising the airway or cervical spine
- LO5 - Properly managing the patient's circulation
- LO6 - Correctly monitor level of conscious
- LO7 - Correctly evaluate/treat eye injury according to JTTS clinical practice guidelines without error
- LO8 - Correctly selecting/applying IV therapy and adjusting fluid resuscitation based on patient's lab values
- LO9 - Calculating the correct dose/administration of infection, analgesia, sedation, and paralytic medication IAW Advanced Trauma Life Support and Advanced Cardiac Life Support
- LO10 - Requesting/interpret appropriate radiography of head, upper extremities, chest, abdominal, pelvic lower extremities, and serum blood work



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LO11 - Identify need for medevac to facility with ophthalmology, initiate transport, call report to accepting provider within 15 minutes of admission

Length

Preparation: 20 minutes
Simulation: 20 minutes
Debrief: 40 minutes
Evaluation: 10 minutes
**Total:** 1.5 hours

Simulator Preparation

SimMan 3G with military uniform

*Moulage*

- OD bruising and abrasions
- Trauma RIGHT nare
- Packing RIGHT nare, blood soaked
- Bruising to RIGHT face
- Fox Shield BOTH eyes
- c-collar
- Helmet

Clinical Practice Guidelines
TCCC Card
JTTS Flow Sheet

Personnel Needed/required

Physician 1
Nurse 1-2
Technicians 2-3

RSVs (by AFSC)

**46N/J/E Nurse**

Nursing assessment
A. Patient care assessment
Implementing Patient Care
A. Airway management/basic cardiac life support
B. Intravenous (IV) therapy
C. Tube/catheter management
D. Blood/urine specimen collection and waived testing
E. Blood/blood component administration
Patient Care Management
A. Wound management
B. Traumatic injury management
C. Pressure monitoring lines
D. Emergency resuscitation of patients



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E. Medication administration

**44E3, Emergency Services Physician**

Trauma and critical care management

A. Trauma management
B. Critical care management

Emergency procedures

A. Secures patient's airway
B. Establishes advanced intravenous access

**44M3X, Internist**

Emergency procedures

A. Secures patient's airway
B. Obtain Intravenous (IV) Access

**42G3, Physician Assistant**

No applicable RSVs

**48X3, Flight Surgeon**

No applicable RSVs

**4N0X1X, 4N0X1C IDMT, 4N0X1 SEI 487**

Fundamentals of Nursing Care

A. Patient assessment
B. Calculate, prepare, and administer medications
C. Initiate, regulate, monitor, and discontinue peripheral Intravenous therapy

Nursing care of patients with special needs

A. Inform the patient not to strain or squeeze their eyelids. Tape a metal fox shield over eye if available or use the bottom of a paper cup.
B. Insert, irrigate, and remove oral gastric tube
C. Establish, maintain, and remove closed urinary drainage system

Nursing care of patients in emergency situations

- Measure and record intake and output



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## SIMULATION FLOW AND EXPECTED INTERVENTIONS

| **State 1** | |
|---|---|
| **Patient Presentation** | **Expected Interventions** |
| Vital Signs:<br>BP: 160/98<br>HR: 128<br>RR: 14<br>$SPO_2$ : 94 (BVM)<br><br>Cardiac Rhythm: Sinus tachycardia<br>Heart Sounds: Normal<br>Breath Sounds: Normal<br>Bowel Sounds: Normal<br>Diaphoresis: Cool/clammy skin<br>Cyanosis: None<br><br>LOC:<br>GCS 12; E 1, V5, M 6<br><br>Facilitator Input (if required)<br><br>Extensive facial bruising, epistaxis controlled with packing from role 1, pt is following commands, anxious, and able to maintain his airway despite extensive facial swelling and significant blood and debris in the mouth. No evidence of orbital floor fracture on palpation. | *Airway*<br>• Assess airway<br>• Assure adequate airway with NP/OP/ETT<br>• C-Spine precautions<br><br>*Breathing*<br>• Assess breathing<br>• Administer oxygen based on neuro status<br><br>*Circulation*<br>• Attach monitors<br>• Gain IV access (as needed)<br>• Begin IV fluid therapy<br><br>Apply metal fox shield to both eyes<br><br>Survey to identify potential bleeding sources: physical exam, FAST, CXR, pelvic XR,<br><br>Stop external bleeding<br><br>*Disability*<br>• Neurologic assessment |
| **Expected Orders** | |
| Maintain airway via cric; X-ray chest, abdomen; blood lab work, nasal wound debridement and irrigation, appropriate wound dressings, repeat labs; monitor fluid input/output. | |



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| State 2 | |
|---|---|
| **Patient Presentation** | **Expected Interventions** |
| Vital Signs:<br>BP: 140/90<br>HR: 122<br>RR: 33<br>$SPO_2$ : 70 ($O_2$)<br><br>Cardiac Rhythm: Sinus tachycardia<br>Heart Sounds: Normal<br>Breath Sounds: Normal<br>Bowel Sounds: Normal<br>Diaphoresis: Diaphoretic/clammy<br>Cyanosis: Becoming dusky from hypoxia<br>LOC:<br>GCS 8T; E 1, V1T, M 6<br><br>Facilitator Input (if required)<br><br>Skin warm to touch, Temp: 36.6 C, FAST negative, Chest and pelvis x-ray study negative<br><br>X-ray head/neck – fracture zygomatic fractures | • Correctly interpret radiography & CT results<br><br>• Identify abnormal lab work<br><br>• Consider blood products; administer blood/FFP/platelets<br><br>• Monitor patient temperature<br><br>• Begin infection control<br>- Antibiotics<br>- Tetanus<br><br>• Begin pain management and short acting sedation as indicated<br><br>• Call next level of care and deliver report<br><br>• Insert and assess placement of OG/NG tube<br><br>• Establish, maintain, and monitor urinary drainage system<br><br>• Prepare for transport |
| **Expected Orders** | |
| Appropriate wound care, apply a fox eye shield or bottom of cup OU; repeat labs; continue monitoring patient, consult with Ophthalmologist for treatment, deliver report, evacuate patient. | |
| **Lab Work** | |
| HCT: 30 Hgb: 14 Platelets: 150 WBC: 6.0 pH: 7.49 CO2 20, PaO2 70<br>Ca+: 2 Lactate: 6.0 PT: 14 INR: 1.1 | |



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**Simulator/Simulation Lab Orientation**

- Orient students to simulator capabilities
- Orient students to simulation work area
- Describe participant expectations
- Emphasize “sense of urgency”
- Emphasize team concept

**Team Resource Management**

- Establish a leader
- Delegate appropriately
- Brief, clear, specific, and timely communications
- Maintain Situational Awareness
- Assign Roles and Responsibilities
- Empower Team members
- Advocate for patient
- SBAR, call-out, handoff



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**Monitor Data**

| | | | | | |
|---|---|---|---|---|---|
| ☐ Art Line | ☒ Capnography | ☐ CVP | ☒ ECG | ☒ $EtCO_2$ | ☐ MAP |
| ☒ NIBP | ☐ PA Catheter | ☒ RR | ☒ $SpO_2$ | ☒ Temp | Other: |

**Equipment**

☐ Patient

☐ IV Pump (w/ primary sets)

☐ Suction (w/ tubing and canister)

☐ Propaq EL206 (w/ accessories)

☐ O2 Source

☐ Portable ventilator (w/ circuit)

☐ Cric kit

☐ Defibrillator

☐ BVM

☐ ET Tube (7.5mm)

☐ Stylet

☐ Syringe 10cc

☐ Non-rebreather mask

☐ Laryngoscope (w/ appropriate sized blade)

☐ Thomas ET Tube Holder

☐ Miscellaneous 1$^{st}$ line ACLS drugs (RFID)

☐ C-collar

☐ Backboard

☐ 4x4s

☐ Kerlix

☐ Fox Shields

☐ 20 Ga 1.25” IV catheters



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☐ 14 Ga 3.25” IV catheters

☐ IV start kit

☐ Foley kit

☐ 0.9% NS

☐ LR

☐ Pen light

☐ JTTS Trauma Flow Sheets

## SIMULATION OPERATOR EXPECTED FLOW

**STATE 1**

BP: 160/98
HR: 128
RR: 14
$SPO_2$: 94 (BVM)
Temp: 35.0

Cardiac Rhythm: Sinus tachycardia
Heart Sounds: Normal
Breath Sounds: Normal
Bowel Sounds: Normal
Pneumo L: No
Pneumo R: No

**STATE 2**

BP: 140/90
HR: 122
RR: 33
$SPO_2$: 70($O_2$)
Temp: 34.6 C

Cardiac Rhythm: Sinus tachycardia
Heart Sounds: Normal
Breath Sounds: Normal
Bowel Sounds: Normal
Pneumo L: No
Pneumo R: No

Learning Objectives

LO1 - **Applying monitors** to the patient without error
LO2 - **Performing a primary survey** within 3 minutes of admission and **perform a secondary survey** within 7 minutes of admission
LO3 - **Applying required oxygen** therapy without error
LO4 - **Managing the patients airway** while maintaining C-Spine alignment without compromising the airway or cervical spine
LO5 - Properly **managing the patient’s circulation**
LO6 - Correctly **monitor level of conscious**
LO7 - Correctly **evaluate/treat eye injury** according to JTTS clinical practice guidelines without error
LO8 - Correctly **selecting/ applying IV therapy** and adjusting fluid resuscitation based on patient’s lab values
LO9 - **Calculating the correct dose**/administration of infection, analgesia, sedation, and paralytic medication IAW Advanced Trauma Life Support and Advanced Cardiac Life Support
LO10 - **Requesting/interpret appropriate radiography** of head, upper extremities, chest, abdominal, pelvic lower extremities, and serum blood work
LO11 - **Identify need for medevac to facility with ophthalmology**, initiate transport, call report to accepting provider within 15 minutes of admission



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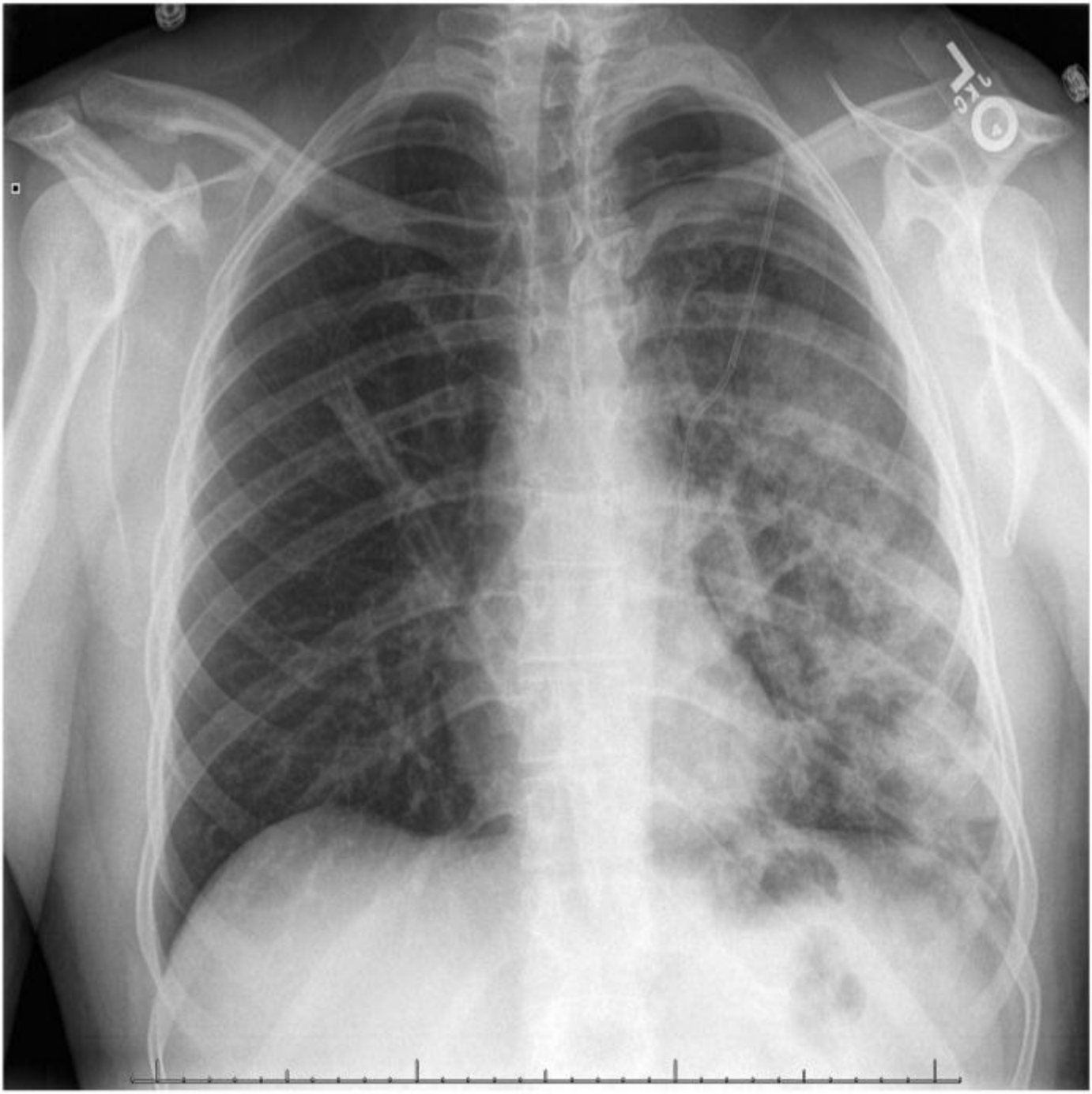
CXR-Adult Male





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## Pelvic Film-Adult Male

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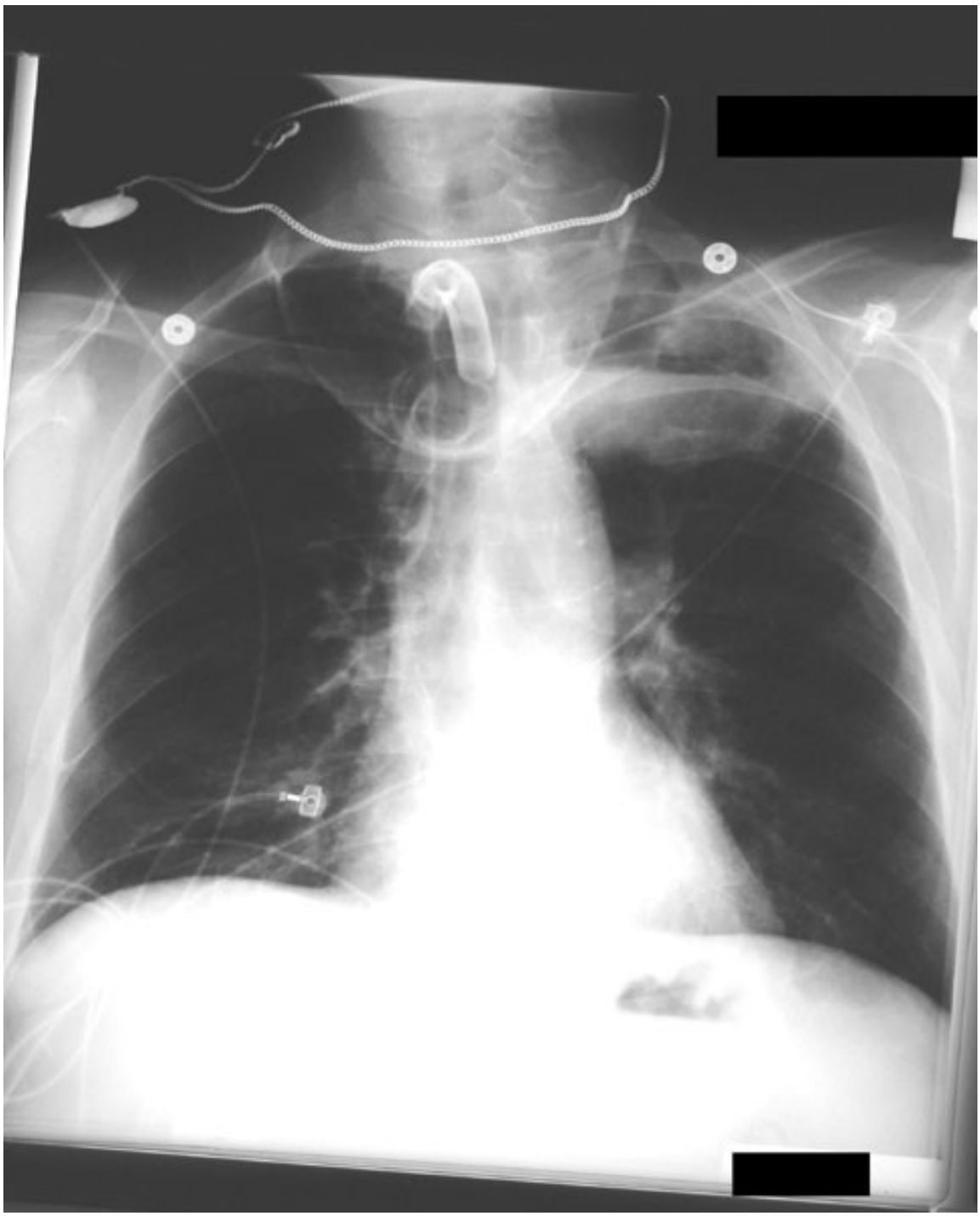
## Post Cricothyrotomy CXR





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## Facial Films

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# Admission Labs

**CBC & Coags**

- Hgb: 12
- HCT: 30
- Plt: 150,000
- WBC: 12,000
- INR: 1.2
- PT: 14
- PTT: 40

**ABG**

- $CO_2$: 61
- $PaO_2$: 58
- $HCO_3$: 14
- Lactate: 2.9
- pH: 7.24



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# Post-Cric Labs

## CBC & Coags

- Hgb: 12
- HCT: 30
- Plt: 150,000
- WBC: 12,000
- INR: 1.2
- PT: 14
- PTT: 40

## ABG

- $CO_2$: 40
- $PaO_2$: 210
- $HCO_3$: 14
- Lactate: 2.9
- pH: 7.34

Note: This will be "on the fly" simulation. The simulation operator is expected to alter physiologic changes based on students' interactions.

Scenario created by: Keith A. Beaulieu, MBA
ICF International



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# Simulated Clinical Encounter (SCE)

# Adult Male with Penetrating Head Injury with Left Pneumothorax Mounted Rocket Propelled Grenade Attack

Background

*Demographics*

25-y/o, 88-kg male, U.S. Army Private who was driving a HUMVEE when his convoy sustained an insurgent RPG attack.

*Injury Pattern*

Laceration on right temple with bruising to right temple area as well as around right check and orbit. Left pneumothorax, right pupil blown, right side skull fracture upon palpation.

*Field Care at Role I*

Left needle compression that was placed incorrectly, OP in place, on BVM no $O_2$. Dressing applied to head. Medic states that he felt crepitus upon palpation of right skull. 18G IV started in right arm.

Learning Objectives

Given a 20-minute adult trauma patient simulation scenario who is suffering from penetrating head trauma, an adult human patient simulator, a facilitator, and the required medical equipment needed to treat this patient, C-STARS students/rotators should be able to correctly apply the required critical thinking and readiness skills needed to stabilize this patient without error, IAW required ATLS and ACLS protocols and JTTS Clinical Practice Guidelines by:

- LO1 - Applying monitors to the patient without error
- LO2 - Performing a primary survey within 3 minutes of admission and perform a secondary survey within 7 minutes of admission
- LO3 - Applying required oxygen therapy without error
- LO4 - Managing the patients airway while maintaining C-Spine alignment without compromising the airway or cervical spine
- LO5 - Properly managing the patient's circulation
- LO6 - Correctly monitor level of conscious
- LO7 - Correctly evaluate/treat penetrating head injury according to JTTS Clinical Practice Guidelines without error
- LO8 - Correctly selecting/applying IV therapy and adjusting fluid resuscitation based on patient's lab values
- LO9 - Calculating the correct dose/administration of infection, analgesia, sedation, and paralytic medication IAW Advanced Trauma Life Support and Advanced Cardiac Life Support
- LO10 - Requesting/interpret appropriate radiography of head, upper extremities, chest, abdominal, pelvic lower extremities, and serum blood work



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LO11 - Identify need for medevac to facility with neurologist, initiate transport, call report to accepting provider within 15 minutes of admission

Length

Preparation: 20 minutes
Simulation: 20 minutes
Debrief: 40 minutes
Evaluation: 10 minutes
**Total:** 1.5 hours

Simulator Preparation

SimMan 3G with military uniform

*Moulage*

- 2cm lacerations to LEFT temple;
- OS pupil dilated;
- LEFT temple bruising;
- LEFT cheek bruising;
- LEFT orbit bruising
- Dressing covering laceration to left temple
- SAM splint c-collar
- Helmet

Clinical Practice Guidelines
TCCC Card
JTTS Flow Sheet

Personnel Needed/required

Physician 1
Nurse 1-2
Technicians 2-3

RSVs (by AFSC)

**46N/J/E Nurse**

Nursing assessment

A. Patient care assessment

Implementing Patient Care

A. Airway management/basic cardiac life support
B. Intravenous (IV) therapy
C. Tube/catheter management
D. Blood/urine specimen collection and waived testing
E. Blood/blood component administration

Patient Care Management

A. Wound management



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B. Traumatic injury management
C. Pressure monitoring lines
D. Emergency resuscitation of patients
E. Medication administration

**44E3, Emergency Services Physician**

Trauma and critical care management

A. Trauma management
B. Critical care management

Emergency procedures

A. Secures patient's airway
B. Establishes advanced intravenous access

**44M3X, Internist**

Emergency procedures

A. Secures patient's airway
B. Obtain Intravenous (IV) Access

**42G3, Physician Assistant**

No applicable RSVs

**48X3, Flight Surgeon**

No applicable RSVs

**4N0X1X, 4N0X1C IDMT, 4N0X1 SEI 487**

Fundamentals of Nursing Care

A. Patient assessment
B. Calculate, prepare, and administer medications
C. Initiate, regulate, monitor, and discontinue peripheral Intravenous therapy

Nursing care of patients with special needs

A. Inform the patient not to strain or squeeze their eyelids. Tape a metal fox shield over eye if available or use the bottom of a paper cup.
B. Suture minor laceration.
C. Insert, irrigate, and remove nasogastric tube
D. Establish, maintain, and remove closed urinary drainage system

Nursing care of patients in emergency situations

A. Measure and record intake and output



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## SIMULATION FLOW AND EXPECTED INTERVENTIONS

<table>
<tr><th colspan="2">State 1</th></tr>
<tr><th>Patient Presentation</th><th>Expected Interventions</th></tr>
<tr><td>Vital Signs:<br>BP: 180/90<br>HR: 128<br>RR: 16 via BVM<br>$SPO_2$: 94 (BVM)<br><br>Cardiac Rhythm: Sinus tachycardia<br>Heart Sounds: Normal<br>Breath Sounds: Absent LEFT<br>Bowel Sounds: Normal<br>Diaphoresis: Cool/clammy skin<br>Cyanosis: None<br>Pupil: Right Blown<br><br>LOC:<br>GCS 3; E 1, V1, M 1<br><br>Facilitator Input (if required)<br><br>Pale and mottled, skin cool to touch<br>Reflex: decerebrate posturing<br>Temp: 38.0 C<br>Minor bleeding from laceration right temple,<br>Crepitus skull right side<br>FAST negative<br>No CT capability</td><td>Airway<br>• Assess airway<br>• Assure adequate airway with NP/OP/ETT<br>• C-Spine precautions<br><br>Breathing<br>• Assess breathing<br>• Administer oxygen based on neuro status<br>• Chest tube as needed<br><br>Circulation<br>• Attach monitors<br>• Gain IV access<br>• Begin IV fluid therapy<br><br>Survey to identify potential bleeding sources: physical exam, FAST, CXR, pelvic XR,<br><br>Stop external bleeding<br><br>Disability<br>• Neurologic assessment<br>• Consult neurosurgeon<br>• Implement Tx to minimize 2° brain injury.</td></tr>
<tr><th colspan="2">Expected Orders</th></tr>
<tr><td colspan="2">Maintain airway; X-ray chest, abdomen; chest tube, blood lab work, endo tracheal intubation if required, appropriate wound debridement and dressings, repeat labs; repeat chest if pt was intubated on arrival; monitor fluid input/output, consult with neurology.</td></tr>
</table>



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| **State 2** | |
|---|---|
| **Patient Presentation** | **Expected Interventions** |
| Vital Signs:<br>BP: 160/60<br>HR: 60s<br>RR: 18 ventilated<br>$SPO_2$: 98 ($O_2$)<br><br>Cardiac Rhythm: Sinus brady<br>Heart Sounds: Normal<br>Breath Sounds: Normal<br>Bowel Sounds: Normal<br>Diaphoresis: Cool/clammy skin<br>Cyanosis: Pale and mottled skin<br><br>LOC:<br>GCS 7T; E 1, V1T, M 5<br><br>Facilitator Input (if required)<br><br>Skin cool to touch<br>Reflex: decerebrate<br>Temp: 38.0 C<br>FAST negative<br>Chest and pelvis x-ray study negative<br>X-ray head/neck – penetrating shrapnel fragments tempora, right temporal bone fracture, bilateral small pneumothoraces | • Correctly interpret radiography & CT results<br><br>• Continue/monitor TX to minimize secondary brain injury<br>- 3% NACL IV, Mannitol, analgesic/sedation meds, IVC, etc.<br><br>• Identify abnormal lab work<br><br>• Consider blood products; administer blood/FFP/platelets<br><br>• Monitor patient temperature<br><br>• Begin infection control<br>- Antibiotics<br>- Tetanus<br><br>• Call next level of care and deliver report<br><br>• Insert and assess placement of OG/NG tube<br><br>• Establish, maintain, and monitor urinary drainage system<br><br>• Prepare for transport |
| **Expected Orders** | |
| Appropriate wound care; repeat labs; continue monitoring patient, consult with neurosurgeon for treatment, deliver report, evacuate patient. | |
| **Lab Work** | |
| HCT: 36 Hgb: 14 pH: 7.25<br>$PCO_2$: 50 $PaO_2$: 56<br>Ca+: 2 Lactate: 3.3 PT: 14 INR: 1.8 NA: 137 | |



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**Simulator/Simulation Lab Orientation**

- Orient students to simulator capabilities
- Orient students to simulation work area
- Describe participant expectations
- Emphasize “sense of urgency”
- Emphasize team concept

**Team Resource Management**

- Establish a leader
- Delegate appropriately
- Brief, clear, specific, and timely communications
- Maintain Situational Awareness
- Assign Roles and Responsibilities
- Empower Team members
- Advocate for patient
- SBAR, call-out, handoff



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**Monitor Data**

| | | | | | |
|---|---|---|---|---|---|
| ☐ Art Line | ☒ Capnography | ☐ CVP | ☒ ECG | ☒ $EtCO_2$ | ☐ MAP |
| ☒ NIBP | ☐ PA Catheter | ☒ RR | ☒ $SpO_2$ | ☒ Temp | Other: |

**Equipment**

☐ Patient

☐ IV Pump (w/ primary sets)

☐ Suction (w/ tubing and canister)

☐ Propaq EL206 (w/ accessories)

☐ O2 Source

☐ Portable ventilator (w/ circuit)

☐ Defibrillator

☐ BVM

☐ ET Tube (7.5mm)

☐ Stylet

☐ Syringe 10cc

☐ Non-rebreather mask

☐ Laryngoscope (w/ appropriate sized blade)

☐ Thomas ET Tube Holder

☐ Miscellaneous 1st line ACLS drugs (RFID)

☐ Mannitol (RFID)

☐ C-collar

☐ Backboard

☐ 4x4s

☐ Kerlix

☐ Chest tube drainage system

☐ 20 Ga 1.25” IV catheters



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☐ 14 Ga 3.25” IV catheters

☐ IV start kit

☐ Foley kit

☐ HPMK

☐ 0.9% NS

☐ 3% NS

☐ LR

☐ Blood Products

☐ Pen light

☐ JTTS Trauma Flow Sheets



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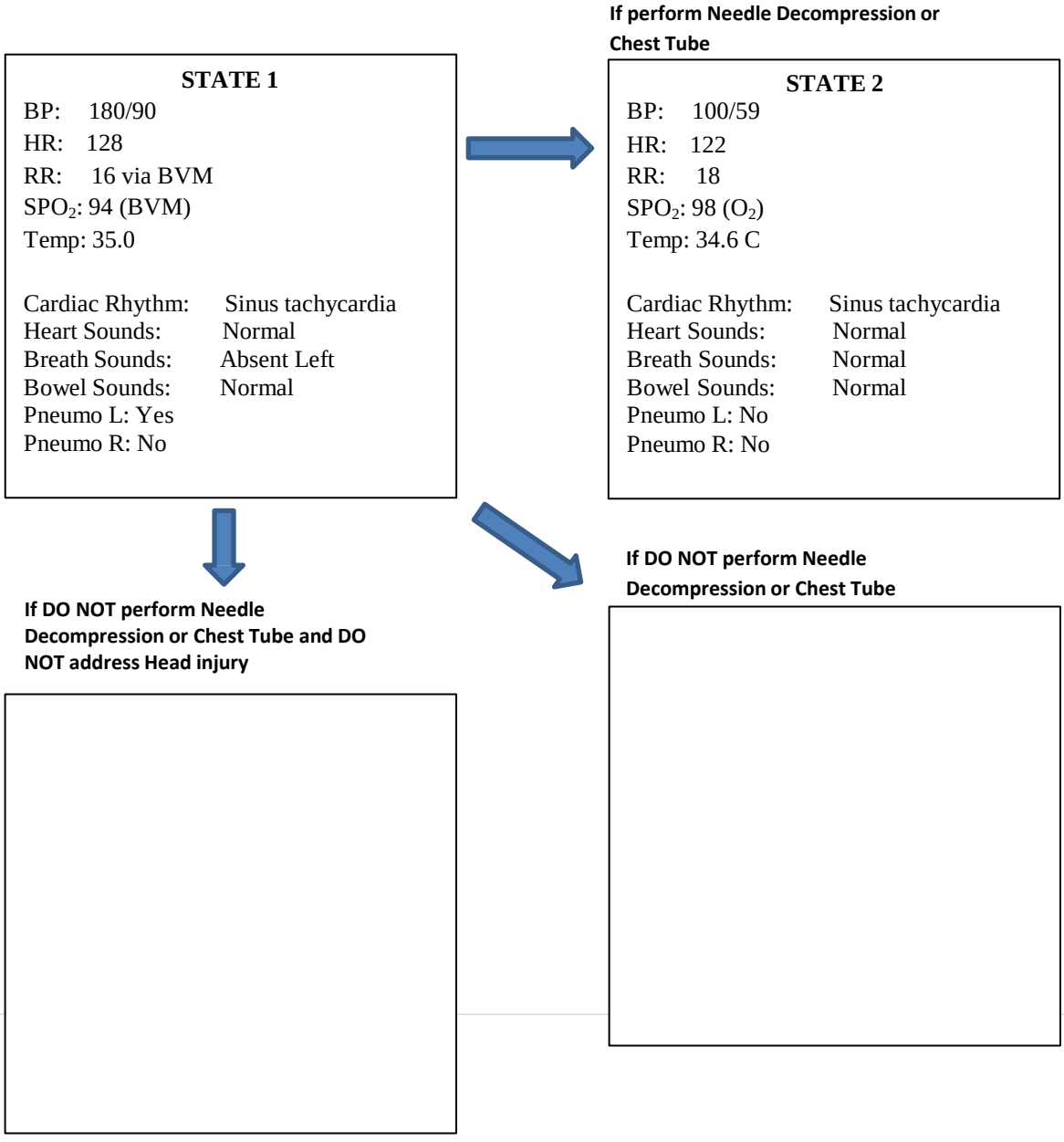
# SIMULATION OPERATOR EXPECTED FLOW



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Adult Male RPG Pre Intubation CXR

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Adult Male RPG Post Intubation CXR

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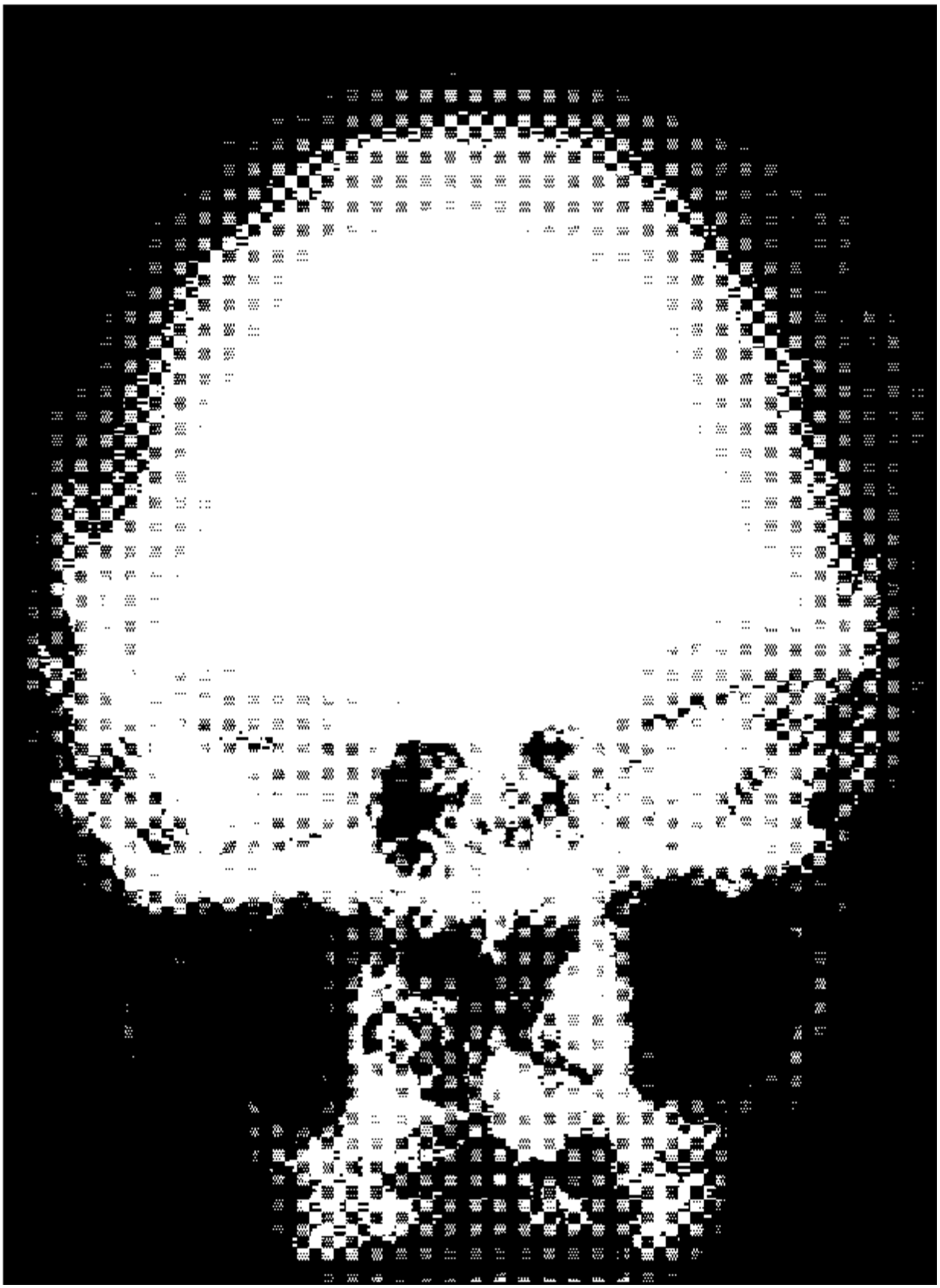
Adult Male RPG Pelvic Film

Distribution A: Approved for public release; distribution is unlimited. Case Number: 88ABW-2014-1767, 17 Apr 2014

Adult Male RPG Skull Film





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Adult Male Post Intubation with Chest Tube Film

*Note: This will be "on-the-fly" simulation. The simulation operator is expected to alter physiologic changes based on students' interactions*

Scenario created by: Keith A. Beaulieu, MBA
ICF International



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# Clinical Encounter (SCE)
# Adult Abdominal and Bilateral Lower Extremity Trauma
# Dismounted IED Blast

Background

*Demographics*

37-y/o, 80-kg male, U.S. Army, Sergeant First Class who was walking to the BX on base when a random mortar attack occurred near the shower trailer. After the explosion, an airman exited the shower trailer and noticed the injured soldier lying on the ground and screaming "medic." SFC Boomer sustained a traumatic amputation of the right lower extremity and scattered shrapnel wounds throughout his body. The airman pulled out SFC Boomer's CAT and applied it to the extremity, and called for the base medics.

*Injury Pattern*

Fragment wounds to abdomen and RLE amputation and LLE avulsion, shortness of breath and nausea. Abdomen is rigid, distended, and bruised. Stated pain 8/10.

Learning Objectives

Given a 20-minute adult trauma patient simulation scenario who is suffering from abdominal injuries and bilateral lower extremities, an adult human patient simulator, a facilitator, and the required medical equipment needed to treat this patient, C-STARS students/rotators should be able to correctly apply the required critical thinking and readiness skills needed to stabilize this patient without error, IAW required ATLS and ACLS protocols and JTTS Clinical Practice Guidelines by:

- LO1 - Applying monitors to the patient
- LO2 - Performing a primary and secondary survey
- LO3 - Applying required oxygen therapy as needed by the patient.
- LO4 - Properly managing the patient's airway including positioning, NPA/OPA placement, BVM and intubation if needed
- LO5 - Correctly protecting C-spine
- LO6 - Correctly administering IV fluids and blood therapy
- LO7 - Controlling external hemorrhage
- LO8 - Searching for other sources of blood loss
- LO9 - Calculating the correct dose and administering antibiotics, pain control, and sedation
- LO10 - Requesting chest, pelvis, and x-rays
- LO11 - Requesting blood lab work
- LO12 - Applying proper therapy for abnormal lab results
- LO13 - Delivering patient report

Length

Preparation: 20 minutes
Simulation: 20 minutes
Debrief: 40 minutes
Evaluation: 10 minutes
**Total:** 1.5 hours



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Simulator Preparation

SimMan 3G with military uniform
CAE Vimedix U/S simulator

*Moula*
*ge*

- Helmet
- Bruising to abdomen
- Shrapnel to abdomen and BLE

Clinical Practice Guidelines
TCCC Card
JTTS Flow Sheet

Personnel Needed/required

| | |
|---|---|
| Physician | 1 |
| Nurse | 1-2 |
| Technicians | 2-3 |

RSVs (by AFSC)

**46N/J/E Nurse**

Nursing assessment
A. Patient care assessment

Implementing Patient Care
A. Airway management/basic cardiac life support
B. Intravenous (IV) therapy
C. Tube/catheter management
D. Blood/urine specimen collection and waived testing
E. Blood/blood component administration

Patient Care Management
A. Wound management
B. Traumatic injury management
C. Pressure monitoring lines
D. Emergency resuscitation of patients
E. Medication administration

**44E3, Emergency Services Physician**

Trauma and critical care management
A. Trauma management
B. Critical care management

Emergency procedures
A. Secures patient's airway
B. Establishes advanced intravenous access

**44M3X, Internist**

Emergency procedures
A. Secures patient's airway
B. Obtain Intravenous (IV) Access



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**42G3, Physician Assistant**

No applicable RSVs

**48X3, Flight Surgeon**

No applicable RSVs

**4N0X1X, 4N0X1C IDMT, 4N0X1 SEI 487**

Fundamentals of Nursing Care

A. Patient assessment
B. Calculate, prepare, and administer medications
C. Initiate, regulate, monitor, and discontinue peripheral Intravenous therapy

Nursing care of patients with special needs

A. Insert, irrigate, and remove nasogastric tube
B. Establish, maintain, and remove closed urinary drainage system

Nursing care of patients in emergency situations

A. Measure and record intake and output



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## SIMULATION FLOW AND EXPECTED INTERVENTIONS

<table>
<tr><th colspan="2">State 1</th></tr>
<tr><th>Patient Presentation</th><th>Expected Interventions</th></tr>
<tr><td>Vital Signs:<br>BP: 98/60<br>HR: 120<br>RR: 30<br>$SPO_2$: 99<br><br>Cardiac Rhythm: Sinus tachycardia<br>Heart Sounds: Normal<br>Breath Sounds: Normal<br>Bowel Sounds: Absent<br>Diaphoresis: Cool/clammy skin<br>Cyanosis: None<br>Pupil: PERRLA<br><br>LOC:<br>GCS 15; E 5, V5, M 5<br><br>Facilitator Input (if required)<br><br>Skin cool & diaphoretic<br><br>Temp: 36.0 C<br><br>Major bleeding from RLE amputation and minor bleeding from LLE avulsion, bruising to abdomen<br><br>FAST positive for splenic bleed</td><td>Airway<br>• Assess airway<br>• Assure adequate airway with NP/OP/ETT<br>• C-Spine precautions<br><br>Breathing<br>• Assess breathing<br>• Administer oxygen<br>• Chest rube as needed<br><br>Circulation<br>• Attach monitors<br>• Gain IV access<br>• Begin IV fluid therapy<br>• Place tourniquet to RLE<br><br>Survey to identify potential bleeding sources: physical exam, FAST, CXR, pelvic XR,<br><br>Stop external bleeding<br><br>Disability<br>• Neurologic assessment</td></tr>
<tr><th colspan="2">Expected Orders</th></tr>
<tr><td colspan="2">Maintain airway; X-ray chest, pelvis, abdomen, blood lab work, endotracheal intubation if required, appropriate wound debridement and dressings, repeat labs; blood transfusion/fluid resuscitation, input/output.</td></tr>
</table>



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| **State 2** | |
|---|---|
| **Patient Presentation** | **Expected Interventions** |
| Vital Signs:<br>BP: 74/48<br>HR: 150<br>RR: 28<br>$SPO_2$: ($O_2$) 96<br><br>Cardiac Rhythm: Sinus tachycardia<br>Heart Sounds: Normal<br>Breath Sounds: Normal<br>Bowel Sounds: Normal<br>Diaphoresis: Cool/clammy skin<br>Cyanosis: Pale and mottled skin<br><br>Facilitator Input (if required)<br><br>Skin cool to touch<br><br>Temp: 38.0 C<br><br>Major bleeding from RLE amputation and minor bleeding from LLE avulsion, bruising to abdomen<br><br>FAST positive for splenic bleed | • Correctly interpret radiography results<br><br>• Identify abnormal lab work<br><br>• Consider blood products; administer blood/FFP/platelets<br><br>• Monitor patient temperature<br><br>• Begin infection control<br>- Antibiotics<br>- Tetanus<br><br>• Call next level of care and deliver report<br><br>• Insert and assess placement of OG/NG tube<br><br>• Establish, maintain, and monitor urinary drainage system<br><br>• Prepare for transport |
| **Expected Orders** | |
| Appropriate wound care; repeat labs; continue monitoring/resuscitation, deliver report, call for surgery or evacuate patient. | |
| **Lab Work** | |
| HCT: 15.7 Hgb: 5.5 Platelets: 20<br>pH: 7.18<br>$CO_2$: 31 $PaO_2$: 60 $HCO_3$: 18<br>Ca+: 1.0 Lactate: 24 PT: _ INR: 2.0<br>WBC: 17 | |

Applicable Clinical Practice Guidelines:

- Blunt Abdominal Trauma
- Management of War Wounds
- Infection Control



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**Simulator/Simulation Lab Orientation**

- Orient students to simulator capabilities
- Orient students to simulation work area
- Describe participant expectations
- Emphasize “sense of urgency”
- Emphasize team concept

**Team Resource Management**

- Establish a leader
- Delegate appropriately
- Brief, clear, specific, and timely communications
- Maintain Situational Awareness
- Assign Roles and Responsibilities
- Empower Team members
- Advocate for patient
- SBAR, call-out, handoff, patient report



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**Monitor Data**

| | | | | | |
|---|---|---|---|---|---|
| ☐ Art Line | ☒ Capnography | ☐ CVP | ☒ ECG | ☒ $EtCO_2$ | ☐ MAP |
| ☒ NIBP | ☐ PA Catheter | ☒ RR | ☒ $SpO_2$ | ☒ Temp | Other: |

**Equipment**

☐ Patient

☐ Suction (w/ tubing and canister)

☐ Propaq EL206 (w/ accessories)

☐ O2 Source

☐ Portable ventilator (w/ circuit)

☐ Defibrillator

☐ BVM

☐ ET Tube (7.5mm)

☐ Stylet

☐ Syringe 10cc

☐ Non-rebreather mask

☐ Laryngoscope (w/ appropriate sized blade)

☐ Thomas ET Tube Holder

☐ Miscellaneous 1st line ACLS drugs (RFID)

☐ C-collar

☐ 4x4s

☐ Kerlix

☐ 20 Ga 1.25” IV catheters

☐ 14 Ga 3.25” IV catheters

☐ IV start kit

☐ Alcohol wipes

☐ Foley kit



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☐ Bear Hugger

☐ 0.9% NS

☐ Blood Products

☐ Pen light

☐ JTTS Trauma Flow Sheets



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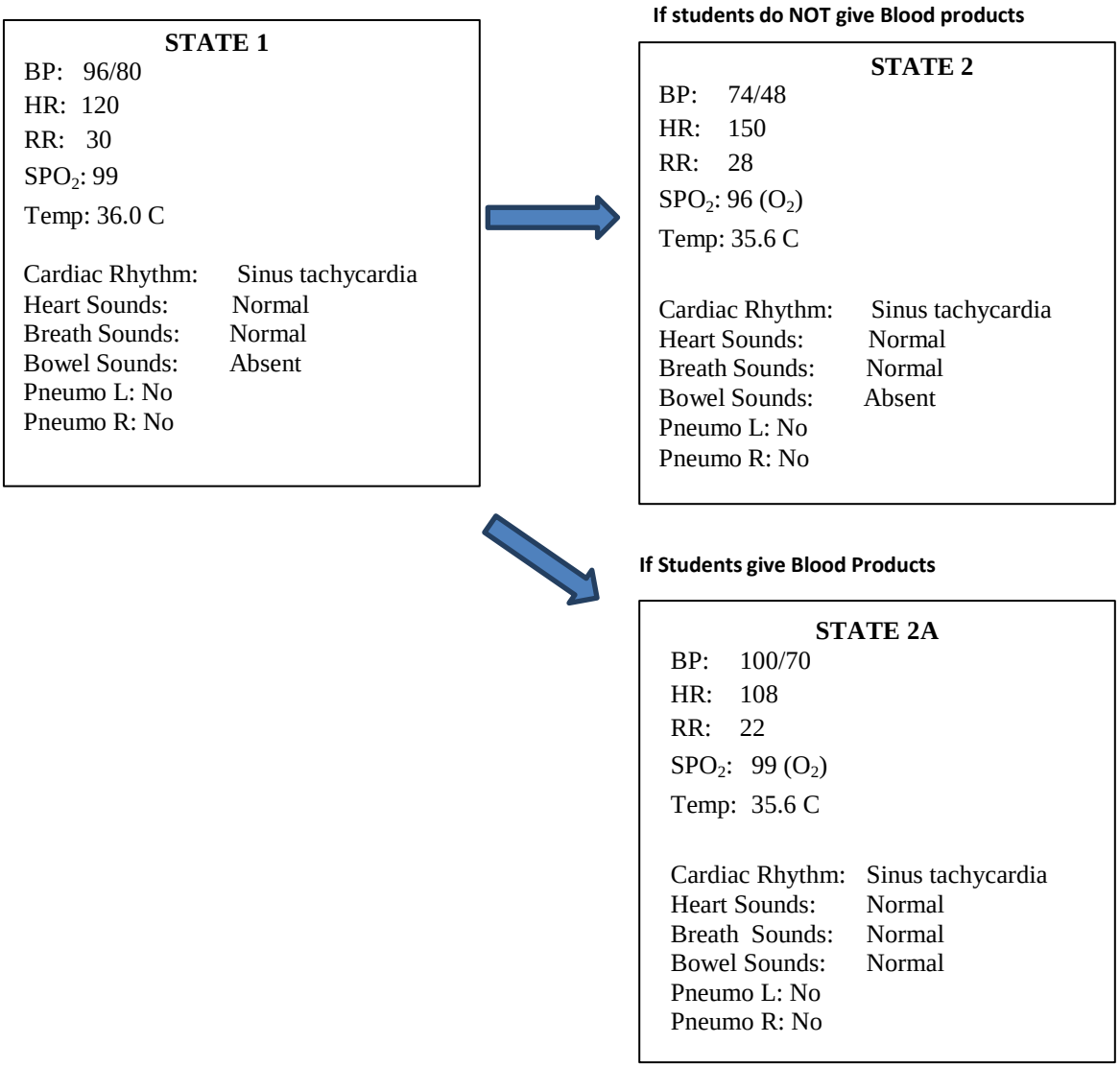
## SIMULATION OPERATOR EXPECTED FLOW



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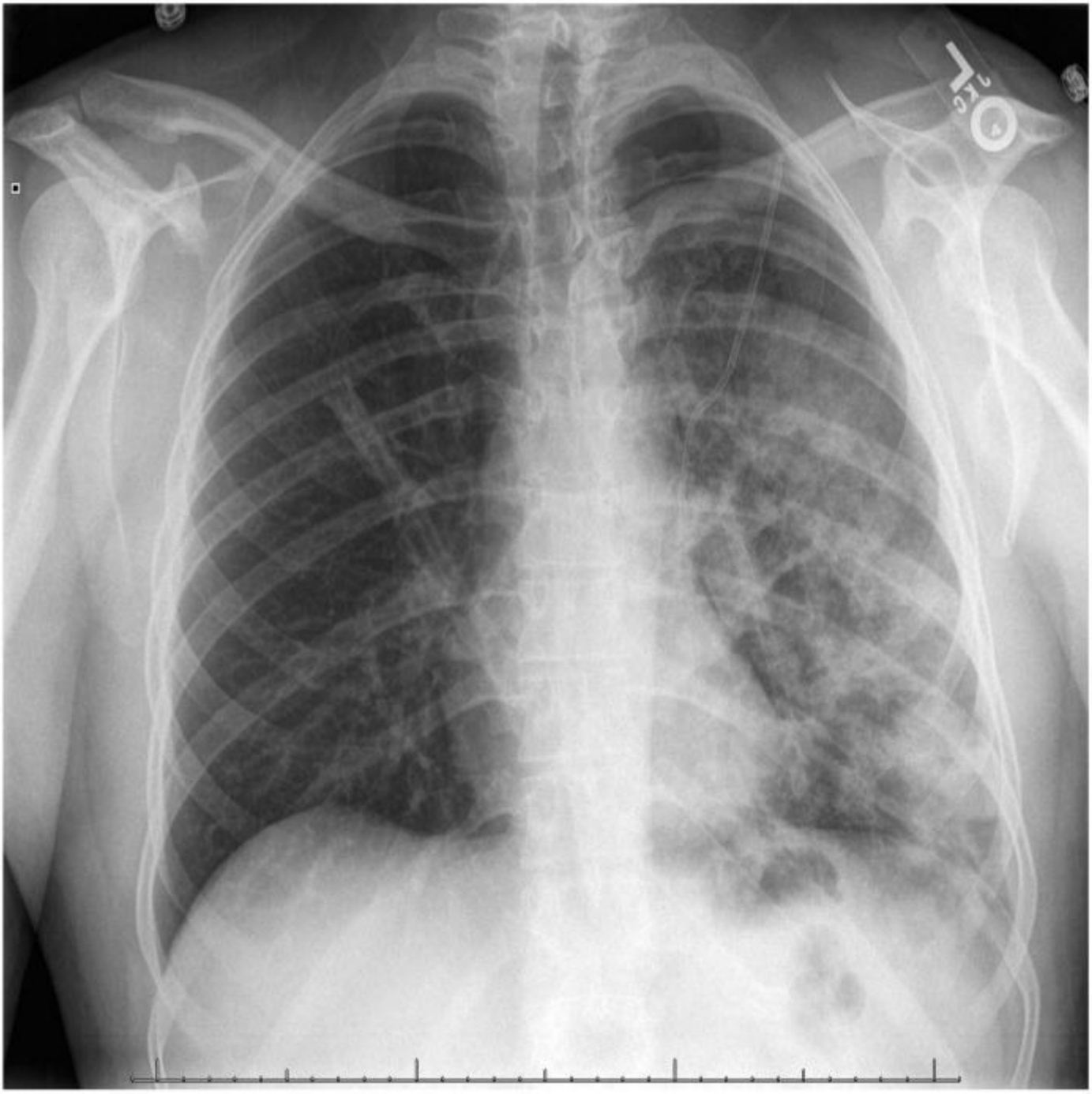
CXR-Adult Male





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**Postintubaion CXR-Adult Male**

Distribution A: Approved for public release; distribution is unlimited. Case Number: 88ABW-2014-1767, 17 Apr 2014

Pelvic Film-Adult Male

Distribution A: Approved for public release; distribution is unlimited. Case Number: 88ABW-2014-1767, 17 Apr 2014

# Admission Labs

## CBC & Coags

- Hgb: 5.5
- HCT: 15.7
- Plt: 70,000
- WBC: 15,000
- INR: 2.0
- PT: 20
- PTT: 50

## ABG

- $CO_2$: 30
- $PaO_2$: 60
- $HCO_3$: 17
- Lactate: 7
- pH: 7.18



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# Post Intubation/Transfusion Labs

## CBC & Coags

- Hgb: 7.3
- HCT: 18
- Plt: 90,000
- WBC: 15,000
- INR: 1.8
- PT: 20
- PTT: 50

## ABG

- $CO_2$: 33
- $PaO_2$: 85
- $HCO_3$: 18
- Lactate: 5
- pH: 7.22

*Note: This will be "on-the-fly" simulation. The simulation operator is expected to alter physiologic changes based on students' interactions*

Scenario created by: Keith A. Beaulieu, MBA
ICF International



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# Multi-Patient Scenario #4-Acute Trauma Management

Background

Team is tasked with providing initial trauma evaluation and resuscitation of casualties arriving from the field. Patients will arrive having received Role 1 care. Following a brief orientation to their environment, they will receive their first patient.

Learning Objectives

Given multiple patients requiring acute care intervention, adult human patient simulators, a facilitator, and the required medical equipment needed to treat these patients, C-STARS students/rotators should be able to correctly apply the required critical thinking and readiness skills needed to stabilize these patients without error, IAW required ATLS and ACLS protocols and JTTS Clinical Practice Guidelines by:

LO1 – Prioritizing patient care
LO2 – Managing team coordination
LO3 – Effectively assigning team assets
LO4 – Performing reassessments as indicated
LO5 – Communicating effectively in a multi-patient scenario
LO6 – Providing appropriate clinical care (see individual patient scenarios)

Length

| | |
|---|---|
| Preparation: | 35 minutes |
| Simulation: | 50 minutes |
| Debrief: | 40 minutes |
| Evaluation: | 10 minutes |
| **Total:** | 2.25 hours |

Simulator Preparation

See individual scenarios for specific preparation of environment, supplies, and simulators.

Personnel Needed/required

| | |
|---|---|
| Physician | 1 |
| Nurse | 2-3 |
| Technicians | 3-4 |



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## SIMULATION FLOW AND EXPECTED INTERVENTIONS

| **State 1"Adult Rhabdomyolysis"-First Patients** | |
|---|---|
| **Patient Presentation** | **Expected Interventions** |
| Team is tasked with evaluating a patient from on base who is complaining of severe leg and flank pain (Adult Rhabdomyolysis). Patient is very vocal about his pain complaints. See specific scenario for appropriate patient responses and management. | Team will evaluate patient and initiate appropriate therapy. |
| **Expected Behaviors** | |
| Team leader will assign roles and monitor team performance. Team leader may become actively involved in patient care as indicated based on team composition and need for interventions. | |
| **State 2 "Adult GSW Left Arm"/"Adult GSW Neck"-Second and Third Patients** | |
| **Patient Presentation** | **Expected Interventions** |
| During evaluation of First Patient, the team will receive two patients with penetrating wounds (Adult GSW Left Arm and Adult GSW Neck). See specific scenario for appropriate patient responses and management. First Patient's condition does not worsen but he does become more disoriented and vocal with his complaints. | Team will evaluate patient and initiate appropriate therapy.<br><br>Team will continue to reevaluate First Patient. |
| **Expected Orders** | |
| Team leader will reassign roles and monitor team performance. Team leader should continue to monitor care of both patients. | |
| **State 3 All Patients** | |
| **Patient Presentation** | **Expected Interventions** |
| Team leader is informed that the current patient load exceeds the local facility capabilities. | Team leader will initiate transfer protocols.<br>Team leader will prioritize patients for transfer.<br>Team will prepare patients for transfer. |
| **Expected Behaviors** | |
| Team leader will monitor both patients. Effective communication and resource management will be demonstrated by team and team leader. | |



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**Team Resource Management**

- Establish a leader
- Delegate appropriately
- Brief, clear, specific, and timely communications
- Maintain Situational Awareness
- Assign Roles and Responsibilities
- Empower Team members
- Advocate for patient
- SBAR, call-out, handoff



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# Simulated Clinical Encounter (SCE)
# Adult Male Rhabdomyolysis

Background

*Demographics*

20-y/o, 65-kg male, U.S. Air Force, Staff Sergeant

*Injury Pattern*

C/o severe bilateral leg, flank, and shoulder pain two days after lifting weights. Also states that his urine is minimal and dark tea colored.

Learning Objectives

Given a 20-minute adult patient simulation scenario who is suffering from severe muscle pain, an adult human patient simulator, a facilitator, and the required medical equipment needed to treat this patient, C-STARS students/rotators should be able to correctly apply the required critical thinking and readiness skills needed to stabilize this patient without error, IAW required ATLS and ACLS protocols and JTTS Clinical Practice Guidelines by:

- LO1 - Applying monitors to the patient without error
- LO2 - Performing a primary survey within 3 minutes of post-op admission and perform a secondary survey within 7 minutes of admission
- LO3 - Applying required oxygen therapy without error
- LO4 - Correctly selecting/ applying IV therapy and adjusting fluid resuscitation based on patient's lab values
- LO5 - Requesting/interpret appropriate radiography of chest and serum blood work
- LO6 - Identify need alteration in patient condition and take appropriate steps based on local protocols and/or ATLS

Length

| | |
|---|---|
| Preparation: | 20 minutes |
| Simulation: | 20 minutes |
| Debrief: | 40 minutes |
| Evaluation: | 10 minutes |
| **Total:** | 1.5 hours |

Simulator Preparation

SimMan 3G AF PT gear



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*Moulage*

- None

Clinical Practice Guidelines
JTTS Flow Sheet

Personnel Needed/required

| | |
|---|---|
| Physician | 1 |
| Nurse | 1-2 |
| Technicians | 2-3 |

RSVs (by AFSC)

**46N/J/E Nurse**

Nursing assessment
A. Patient care assessment

Implementing Patient Care
A. Airway management/basic cardiac life support
B. Intravenous (IV) therapy
C. Tube/catheter management
D. Blood/urine specimen collection and waived testing
E. Blood/blood component administration

Patient Care Management
A. Wound management
B. Traumatic injury management
C. Pressure monitoring lines
D. Emergency resuscitation of patients
E. Medication administration

**44E3, Emergency Services Physician**

Trauma and critical care management
A. Trauma management
B. Critical care management

Emergency procedures
A. Secures patient's airway
B. Establishes advanced intravenous access

**44M3X, Internist**

Emergency procedures
A. Secures patient's airway
B. Obtain Intravenous (IV) Access

**42G3, Physician Assistant**

No applicable RSVs

**48X3, Flight Surgeon**

No applicable RSVs

**4N0X1X, 4N0X1C IDMT, 4N0X1 SEI 487**

Fundamentals of Nursing Care



Distribution A: Approved for public release; distribution is unlimited. Case Number: 88ABW-2014-1767, 17 Apr 2014

A. Patient assessment
B. Calculate, prepare, and administer medications
C. Initiate, regulate, monitor, and discontinue peripheral Intravenous therapy

Nursing care of patients with special needs

A. Establish, maintain, and remove closed urinary drainage system

Nursing care of patients in emergency situations

A. Measure and record intake and output



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## SIMULATION FLOW AND EXPECTED INTERVENTIONS

| **State 1** | |
|---|---|
| **Patient Presentation** | **Expected Interventions** |
| Vital Signs:<br>BP: 160/90<br>HR: 100<br>RR: 26<br>$SPO_2$:<br><br>Cardiac Rhythm: Sinus tachycardia<br>Heart Sounds: Normal<br>Breath Sounds: Normal<br>Bowel Sounds: Normal<br>Diaphoresis: None<br>Cyanosis: None<br>Pupil: PERRLA<br><br>LOC:<br>GCS 15<br>• Eyes – 4 Spontaneous<br>• Verbal – 5 Oriented<br>• Motors – 6 Obeys Commands | *Airway*<br>• Assess airway<br>• Assure adequate airway with NP/OP/ETT<br>- Wean off mechanical ventilation as tolerated<br>• C-Spine precautions (as needed)<br><br>*Breathing*<br>• Assess breathing<br>• Administer oxygen based on neuro status<br>• Chest tube as needed<br><br>*Circulation*<br>• Attach monitors<br>• Gain IV access (as needed)<br>• Continue IV fluid/ blood resuscitation as needed<br><br>Obtain a history<br>• SAMPLE |
| **Expected Orders** | |
| IV therapy, ABG, Venous sample. | |



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| State 2 | |
|---|---|
| **Patient Presentation** | **Expected Interventions** |
| Vital Signs:<br>BP: 165/90<br>HR: 110<br>RR: 26<br>SPO2 :<br><br>Cardiac Rhythm: Sinus tachycardia<br>Heart Sounds: Normal<br>Breath Sounds: Normal<br>Bowel Sounds: Normal<br>Diaphoresis: None<br>Cyanosis: None<br>Pupil:<br>PERRLA<br><br>LOC:<br>GCS 15<br>• Eyes – 4 Spontaneous<br>• Verbal – 5 Oriented<br> | |
| **Expected Orders** | |
| 12-lead EKG, 1500 ml/hr NaCl, foley insertion, strict I&Os, Need to transport to Role III via CCATT, consult nephrology. | |
| **Lab Work** | |
| See lab work | |



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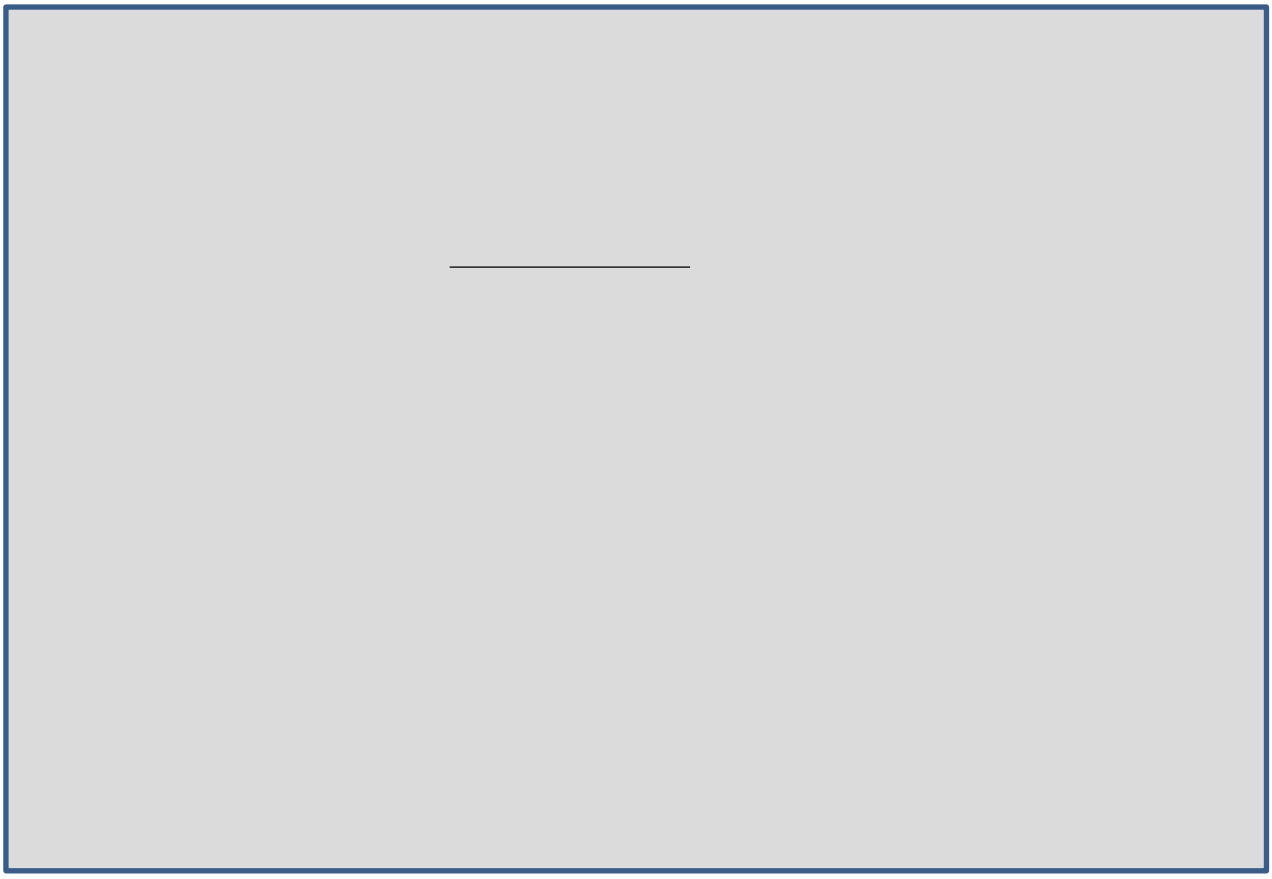

**Simulator/Simulation Lab Orientation**

- Orient students to simulator capabilities
- Orient students to simulation work area
- Describe participant expectations
- Emphasize “sense of urgency”
- Emphasize team concept

**Team Resource Management**

- Establish a leader
- Delegate appropriately
- Brief, clear, specific, and timely communications
- Maintain Situational Awareness
- Assign Roles and Responsibilities
- Empower Team members
- Advocate for patient
- SBAR, call-out, handoff



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## Monitor Data

| | | | | | |
|---|---|---|---|---|---|
| ☐ Art Line | ☒ Capnography | ☐ CVP | ☒ ECG | ☒ $EtCO_2$ | ☐ MAP |
| ☒ NIBP | ☐ PA Catheter | ☒ RR | ☒ $SpO_2$ | ☒ Temp | Other: |

## Equipment

☐ Patient

☐ IV Pump (w/ primary sets)

☐ Suction (w/ tubing and canister)

☐ Propaq EL206 (w/ accessories)

☐ O2 Source

☐ Portable ventilator (w/ circuit)

☐ Defibrillator

☐ BVM

☐ ET Tube (7.5mm)

☐ Stylet

☐ Syringe 10cc

☐ Non-rebreather mask

☐ Laryngoscope (w/ appropriate sized blade)

☐ Thomas ET Tube Holder

☐ Miscellaneous 1st line ACLS drugs (RFID)

☐ O2 source with nebulizer

☐ C-collar

☐ SAM Splint

☐ Backboard

☐ 4x4s

☐ Kerlix

☐ Chest tube drainage system

☐ 20 Ga 1.25” IV catheters



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☐ 14 Ga 3.25” IV catheters

☐ IV start kit

☐ IV training arm

☐ Alcohol wipes

☐ Foley kit

☐ HPMK

☐ 0.9% NS

☐ 3% NS

☐ LR

☐ Blood Products

☐ Pen light

☐ JTTS Trauma Flow Sheets

**Labwork**

Time : 12:33 PM

- pH 7.2 , pCO2 30 , paO2 90
- Hgb 17
- Hct 42
- Lactate 5
- CPK 20,000
- Serum Myoglobin 50,000
- iCA .85
- K+ 7.8
- Na 145
- Serum Osm 350
- BUN 30
- Creat 4.2



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**Simulator Stating State**

**START STATE**

A&O x 3
Airway: Patent
Breathing: 26
Circulation: BP: 160/90
Pulse: 100
Skin: warm

Cap refill: < 3 sec

LOC: slightly confused but oriented to person and place Airway: Patent
Breathing: 26
O2 sat:
Circulation:
BP: 165/90
Pulse: 110

Skin: warm and dry
Cap refill: <3 sec



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**Voice Scripting**

Initial

| **Operator** | |
|---|---|
| START | Help, I'm having severe pain |
| IF PROMPTED | My name is John Doe |

History

| **Operator** | |
|---|---|
| IF PROMPTED | **S** Both my legs hurt really bad and my right abdominals and legs<br>**A** No allergies<br>**M** No medicine other than malaria meds, I also take the "jacked" supplements<br>**P** Never felt like this before, I've had muscle tears and injuries but this hurts like hell<br>**L** I drank water while I was running<br>**E** I lifted weight about two hours ago |
| **Operator** | |
| IF PROMPTED | **O** I was taking a nap after a hard workout and woke up in extreme pain<br>**P** nothing<br>**Q** feels like 1000 knifes stabbing me<br>**R** In my chest only<br>**S** 9<br>**T** It feels like it's getting worse |



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Urine Sample

Scenario created by: Keith A. Beaulieu, MBA
ICF International



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# Simulated Clinical Encounter (SCE)
# Adult GSW Left arm

**Note** This can also be done as an autocase**

Background

*Demographics*
20-y/o, 80-kg male, U.S. Army Private.

Soldier sustained a single gunshot wound while performing house clearing operations in Kandahar Province.

*Injury Pattern*
Single GSW to left arm just proximal to the elbow; heavy bleeding; closed fracture; stated pain 8/10.

*Field Care (echelon I & II)*
Tourniquet applied to stop bleeding. Entrance only wound visualized. Crepitus felt by medic, SAM splint applied, ruggedized IV started, left AC (no fluids given), morphine (5mg IV) x1 given for pain, HPMK and prepped for med-evac.

Learning Objectives

Given a 20-minute adult trauma patient simulation scenario who is suffering from single gunshot wound, an adult human patient simulator, a facilitator, and the required medical equipment needed to treat this patient, CSTARS students/rotators should be able to correctly apply the required critical thinking and readiness skills needed to stabilize this patient without error, IAW required ATLS and ACLS protocols and JTTS Clinical Practice Guidelines by:

- LO1 - Applying monitors to the patient
- LO2 - Performing a primary and secondary survey
- LO3 - Applying required oxygen therapy as needed by the patient.
- LO4 - Properly managing the patient's airway including positioning, NPA/OPA placement, BVM and intubation if needed
- LO5 - Correctly protecting C-spine (if needed)
- LO6 - Correctly administering IV fluids and blood therapy
- LO7 - Controlling external hemorrhage
- LO8 - Searching for other sources of blood loss
- LO-9 - Calculating the correct dose and administering antibiotics, pain control, and sedation
- LO10 - Requesting chest, pelvis, and x-rays
- LO11 - Requesting blood lab work
- LO12 - Applying proper therapy for abnormal lab results
- LO13 - Delivering patient report



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Length

Preparation: 20 minutes
Simulation: 20 minutes
Debrief: 40 minutes
Evaluation: 10 minutes
**Total:** 1.5 hours

Simulator Preparation

SimMan 3G with military uniform

*Moulage*

- SAM splint LEFT arm
- Helmet
- Bleeding module for left arm and 3G prepped for blood
- GSW LEFT arm (entrance)

Clinical Practice Guidelines
TCCC Card
JTTS Flow Sheet

Personnel Needed/required

Physician 1
Nurse 1-2
Technicians 2-3

RSVs (by AFSC)

**46N/J/E Nurse**

Nursing assessment
A. Patient care assessment

Implementing Patient Care
A. Airway management/basic cardiac life support
B. Intravenous (IV) therapy
C. Tube/catheter management
D. Blood/urine specimen collection and waived testing
E. Blood/blood component administration

Patient Care Management
A. Wound management
B. Traumatic injury management
C. Pressure monitoring lines
D. Emergency resuscitation of patients
E. Medication administration

**44E3, Emergency Services Physician**

Trauma and critical care management
A. Trauma management
B. Critical care management

Emergency procedures
A. Secures patient's airway



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B. Establishes advanced intravenous access

**44M3X, Internist**

Emergency procedures

A. Secures patient's airway
B. Obtain Intravenous (IV) Access

**42G3, Physician Assistant**

No applicable RSVs

**48X3, Flight Surgeon**

No applicable RSVs

**4N0X1X, 4N0X1C IDMT, 4N0X1 SEI 487**

Fundamentals of Nursing Care

A. Patient assessment
B. Calculate, prepare, and administer medications
C. Initiate, regulate, monitor, and discontinue peripheral Intravenous therapy

Nursing care of patients with special needs

A. Inform the patient not to strain or squeeze their eyelids. Tape a metal fox shield over eye if available or use the bottom of a paper cup.
B. Suture minor laceration.
C. Insert, irrigate, and remove nasogastric tube
D. Establish, maintain, and remove closed urinary drainage system

Nursing care of patients in emergency situations

A. Measure and record intake and output



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**SIMULATION FLOW AND EXPECTED INTERVENTIONS**

| **State 1** | |
|---|---|
| **Patient Presentation** | **Expected Interventions** |
| Vital Signs:<br>BP: 98/60<br>HR: 128<br>RR: 30<br>$SPO_2$: 99<br><br>Cardiac Rhythm: Sinus tachycardia<br>Heart Sounds: Normal<br>Breath Sounds: Normal<br>Bowel Sounds: Absent<br>Diaphoresis: Cool/Clammy skin<br>Cyanosis: None<br>Pupil: PERRLA<br><br>LOC:<br>GCS 15; E 5, V5, M 5<br><br>Facilitator Input (if required)<br><br>Skin cool to touch<br>Temp: 36.0 C | *Airway*<br>• Assess airway<br>• Assure adequate airway with NP/OP/ETT<br>• C-Spine precautions<br><br>*Breathing*<br>• Assess breathing<br>• Administer oxygen<br>• Chest tube as needed<br><br>*Circulation*<br>• Attach monitors<br>• Gain IV access (as needed)<br>• Begin IV fluid therapy<br><br>Survey to identify potential bleeding sources: physical exam, FAST, CXR, pelvic XR,<br><br>Stop external bleeding<br><br>*Disability*<br>• Neurologic assessment |
| **Expected Orders** | |
| Maintain airway; X-ray chest, pelvis, abdomen, blood lab work, endotracheal intubation if required, appropriate wound debridement and dressings, repeat labs; monitor fluid input/output. | |



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| State 2 | |
|---|---|
| **Patient Presentation** | **Expected Interventions** |
| Vital Signs:<br>BP: 100/68<br>HR: 128<br>RR: 24<br>$SPO_2$: 99<br><br>Cardiac Rhythm: Sinus tachycardia<br>Heart Sounds: Normal<br>Breath Sounds: Normal<br>Bowel Sounds: Absent<br>Diaphoresis: Cool/clammy skin<br>Cyanosis: None<br>Pupil: PERRLA<br><br>LOC:<br>GCS 15; E 5, V5, M 5<br><br>Facilitator Input (if required)<br><br>Skin cool to touch<br>Temp: 38.0 C<br>Pt is getting sleepy | • Correctly interpret radiography & CT results<br><br>• Identify abnormal lab work<br><br>• Consider blood products; administer blood/FFP/platelets<br><br>• Monitor patient temperature<br><br>• Begin infection control<br>- Antibiotics<br>- Tetanus<br><br>• Call next level of care and deliver report<br><br>• Insert and assess placement of OG/NG tube<br><br>• Establish, maintain, and monitor urinary drainage system<br><br>• Prepare for transport |
| **Expected Orders** | |
| Appropriate wound care; repeat labs; Blood products, continue monitoring patient, deliver report, call for surgery or evacuate patient. | |



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**Lab Work**

Time : 08:37 AM

| | | |
|---|---|---|
| pH | (7.34-7.46) | :7.38 |
| HC03- | (22-26) | :18.0 mEq/L |
| Base excess | (+/- 2) | : -6.4 |
| PCO | (33-46) | : 21.6 mmHg |
| PO2 | (75-100) | : 101.6 mmHg |
| SaO2 | (> 95) | : 97% |
| Lactate | (0-1) | : 6.6 mM |
| HCT | (0.4-0.45) | : 0.35 mEq/L |
| K+ | (3.6-4.6) | : 3.9 mEq/L |
| Na+ | (133-143) | : 135 mEq/L |
| Cl- | (60-100) | : 102.4 mEq/L |
| Ca++ | (4.4-5.9) | : 5.1 mg/dL |
| Glucose | (70-110) | : 79.5 mg/dL |
| Hb | (10.0-14.5) | : 11.83 g/dL |
| CO-Hb | (< 3) | : 0.00% |

Time :0:900 AM

| | | |
|---|---|---|
| Na+ | (133-142) | : 135 mEq/L |
| K+ | (3.6-4.6) | : 4.1 mEq/L |
| Cl- | (60-100) | : 102.0 mEq/L |
| Glucose | (70-110) | : 90.1 mg/dL |
| Calcium, ionized | (4.4-5.9) | :5.2 mg/dL |
| Calcium, total | (8.5-10.5) | :10.0 mg/dL |
| Magnesium sulfate | (1.3-2.1) | :1.4 mg/dL |
| Hb | (13.5-17.5) | :12.01 g/dL |
| HCT | (40-45) | :36 |
| WBC | (4-11*10^9) | :8.2*10^9/L |
| Platelets | (150-400*10^9) | :279*10^9/L |

| | |
|---|---|
| Activated partial throboplastin time (APTT) (25-40) | :3.6 s |
| Prothrombin time (PT) (10-13) | :9.1 s |
| International Normalized Ratio (INR) (0.9-1.2) | :1.1 s |
| Fibrinogen (200-400) | : 322.7 mg/dL |

Applicable Clinical Practice Guidelines:

- Management of War Wounds
- Infection Control



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**Simulator/Simulation Lab Orientation**

- Orient students to simulator capabilities
- Orient students to simulation work area
- Describe participant expectations
- Emphasize “sense of urgency”
- Emphasize team concept

**Team Resource Management**

- Establish a leader
- Delegate appropriately
- Brief, clear, specific, and timely communications
- Maintain Situational Awareness
- Assign Roles and Responsibilities
- Empower Team members
- Advocate for patient
- SBAR, call-out, handoff, patient report



Distribution A: Approved for public release; distribution is unlimited. Case Number: 88ABW-2014-1767, 17 Apr 2014

## Monitor Data

| | | | | | |
|---|---|---|---|---|---|
| ☐ Art Line | ☒ Capnography | ☐ CVP | ☒ ECG | ☒ $EtCO_2$ | ☐ MAP |
| ☒ NIBP | ☐ PA Catheter | ☒ RR | ☒ $SpO_2$ | ☒ Temp | Other: |

## Equipment

☐ Patient

☐ IV Pump (w/ primary sets)

☐ Suction (w/ tubing and canister)

☐ Propaq EL206 (w/ accessories)

☐ O2 Source

☐ Portable ventilator (w/ circuit)

☐ Defibrillator

☐ BVM

☐ ET Tube (7.5mm)

☐ Stylet

☐ Syringe 10cc

☐ Non-rebreather mask

☐ Laryngoscope (w/ appropriate sized blade)

☐ Thomas ET Tube Holder

☐ Miscellaneous 1st line ACLS drugs (RFID)

☐ Mannitol (RFID)

☐ C-collar

☐ SAM Splint

☐ Backboard

☐ 4x4s

☐ Kerlix

☐ Chest tube drainage system

☐ 20 Ga 1.25” IV catheters



Distribution A: Approved for public release; distribution is unlimited. Case Number: 88ABW-2014-1767, 17 Apr 2014

☐ 14 Ga 3.25” IV catheters

☐ IV start kit

☐ IV training arm

☐ Alcohol wipes

☐ Foley kit

☐ HPMK

☐ 0.9% NS

☐ 3% NS

☐ LR

☐ Blood Products

☐ Pen light

☐ JTTS Trauma Flow Sheets

## SIMULATION OPERATOR EXPECTED FLOW

**STATE 1**

Vital Signs:
BP: 98/60
HR: 128
RR: 30
$SPO_2$: 99

Cardiac Rhythm: Sinus tachycardia
Heart Sounds: Normal
Breath Sounds: Normal
Bowel Sounds: Absent
Diaphoresis: Cool/clammy skin
Cyanosis: None
Pupil: PERRLA

LOC:
GCS 15; E 5, V5, M 5

**If students do NOT give Blood products**

**STATE 2**

Vital Signs:
BP: 100/68
HR: 128
RR: 24
$SPO_2$: 99

Cardiac Rhythm: Sinus tachycardia
Heart Sounds: Normal
Breath Sounds: Normal
Bowel Sounds: Absent
Diaphoresis: Cool/clammy skin
Cyanosis: None
Pupil: PERRLA

LOC:
GCS 15; E 5, V5, M 5



Distribution A: Approved for public release; distribution is unlimited. Case Number: 88ABW-2014-1767, 17 Apr 2014

*Arterial Blood Gas*

Time : 08:37 AM

| | | |
|---|---|---|
| pH | (7.34-7.46) | : 7.38 |
| HCO3- | (22-26) | : 18.0 mEq/L |
| Base excess (+/- 2) | | : -6.4 |
| PCO2 | (33-46) | : 21.6 mmHg |
| PO2 | (75-100) | : 101.6 mmHg |
| SaO2 | (> 95) | : 97% |
| Lactate | (0-1) | : 6.6 mM |
| HCT | (0.4-0.45) | : 0.35 mEq/L |
| K+ | (3.6-4.6) | : 3.9 mEq/L |
| Na+ | (133-143) | : 135 mEq/L |
| Cl- | (60-100) | : 102.4 mEq/L |
| Ca++ | (4.4-5.9) | : 5.1 mg/dL |
| Glucose | (70-110) | : 79.5 mg/dL |
| Hb | (10.0-14.5) | : 11.83 g/dL |
| CO-Hb | (< 3) | : 0.00% |

*Venous Labwork*

Time : 09:00 AM

| | | |
|---|---|---|
| Na+ | (133-142) | : 135 mEq/L |
| K+ | (3.6-4.6) | : 4.1 mEq/L |
| Cl- | (60-100) | : 102.0 mEq/L |
| Glucose | (70-110) | : 90.1 mg/dL |
| Calcium, ionized | (4.4-5.9) | : 5.2 mg/dL |
| Calcium, total | (8.5-10.5) | : 10.0 mg/dL |
| Magnesium sulfate | (1.3-2.1) | : 1.4 mEq/L |
| Hb | (13.5-17.5) | : 12.01 g/dL |
| HCT | (40-45) | : 36 |
| WBC | (4-11*10^9) | : 8.2 *10^9/L |
| Platelets | (150-400*10^9) | : 279 *10^9/L |
| Activated partial thromboplastin time (APTT) | (25-40) | : 33.6 s |
| Prothrombin time (PT) | (10-13) | : 9.1 s |
| International Normalized Ratio (INR) | (0.9-1.2) | : 1.1 |
| Fibrinogen | (200-400) | : 322.7 mg/dL |



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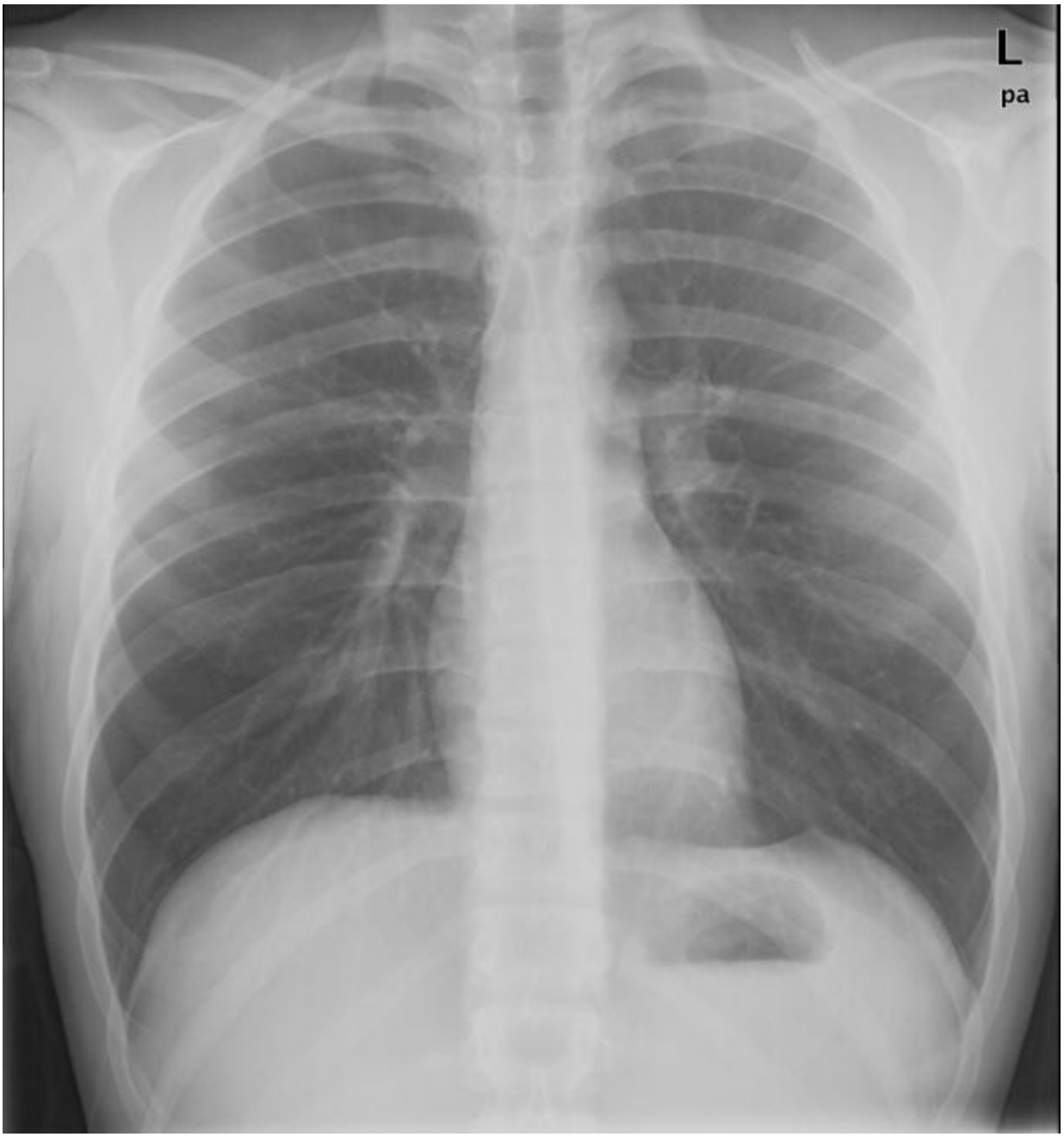




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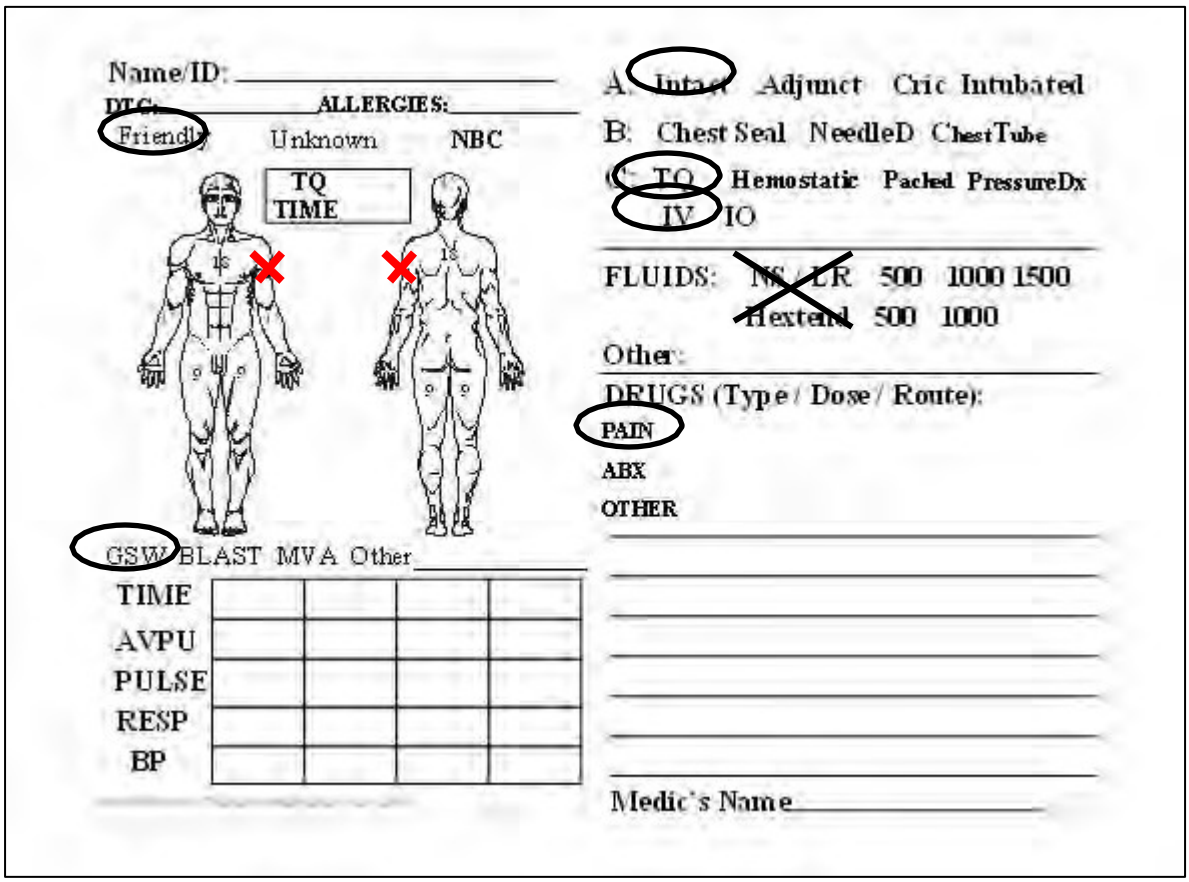
*TCCC Card*




*Note: This will be "on-the-fly" simulation. The simulation operator is expected to alter physiologic changes based on students' interactions*

Scenario created by: Keith A. Beaulieu, MBA
ICF International



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# Simulated Clinical Encounter (SCE)
# Adult GSW Neck

**Note** This can also be done as an autocase**

Background

*Demographics*
26-y/o, 80-kg male, U.S. Army Ranger medic.

Soldier sustained a single gunshot wound while performing house clearing operations in Kandahar Province.

*Injury Pattern*
Single GSW to neck left side lateral to trachea. Heavy bleeding. Patient unconscious.

*Field Care (echelon I & II)*
Combat gauze and Israeli bandage applied. Entrance only wound visualized. SAM splint c-collar applied, ruggedized IV started, left AC (500 ml Hextend), NP airway, HPMK and prepped for med-evac.

Learning Objectives

Given a 20-minute adult trauma patient simulation scenario who is suffering from single gunshot wound, an adult human patient simulator, a facilitator, and the required medical equipment needed to treat this patient, C-STARS students/rotators should be able to correctly apply the required critical thinking and readiness skills needed to stabilize this patient without error, IAW required ATLS and ACLS protocols and JTTS Clinical Practice Guidelines by:

- LO1 - Applying monitors to the patient
- LO2 - Performing a primary and secondary survey
- LO3 - Applying required oxygen therapy as needed by the patient.
- LO4 - Properly managing the patient's airway including positioning, NPA/OPA placement, BVM and intubation if needed
- LO5 - Correctly protecting C-spine (if needed)
- LO6 - Correctly administering IV fluids and blood therapy
- LO7 - Controlling external hemorrhage
- LO8 - Searching for other sources of blood loss
- LO9 - Calculating the correct dose and administering antibiotics, pain control, and sedation
- LO10 - Requesting chest, pelvis, and x-rays
- LO11 - Requesting blood lab work
- LO12 - Applying proper therapy for abnormal lab results
- LO13 - Delivering patient report



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Length

Preparation: 20 minutes
Simulation: 20 minutes
Debrief: 40 minutes
Evaluation: 10 minutes
**Total:** 1.5 hours

Simulator Preparation

SimMan 3G with military uniform

*Moulage*

- SAM splint C-collar
- Helmet
- Bleeding module for neck/FEBBSS and 3G prepped for blood
- GSW LEFT neck

Clinical Practice Guidelines
TCCC Card
JTTS Flow Sheet

Personnel Needed/required

Physician 1
Nurse 1-2
Technicians 2-3

RSVs (by AFSC)

**46N/J/E Nurse**

Nursing assessment

A. Patient care assessment

Implementing Patient Care

A. Airway management/basic cardiac life support
B. Intravenous (IV) therapy
C. Tube/catheter management
D. Blood/urine specimen collection and waived testing
E. Blood/blood component administration

Patient Care Management

A. Wound management
B. Traumatic injury management
C. Pressure monitoring lines
D. Emergency resuscitation of patients
E. Medication administration

**44E3, Emergency Services Physician**

Trauma and critical care management

A. Trauma management
B. Critical care management

Emergency procedures

A. Secures patient's airway
B. Establishes advanced intravenous access



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**44M3X, Internist**

Emergency procedures

A. Secures patient's airway
B. Obtain Intravenous (IV) Access

**42G3, Physician Assistant**

No applicable RSVs

**48X3, Flight Surgeon**

No applicable RSVs

**4N0X1X, 4N0X1C IDMT, 4N0X1 SEI 487**

Fundamentals of Nursing Care

A. Patient assessment
B. Calculate, prepare, and administer medications
C. Initiate, regulate, monitor, and discontinue peripheral Intravenous therapy

Nursing care of patients with special needs

A. Inform the patient not to strain or squeeze their eyelids. Tape a metal fox shield over eye if available or use the bottom of a paper cup.
B. Suture minor laceration
C. Insert, irrigate, and remove nasogastric tube
D. Establish, maintain, and remove closed urinary drainage system

Nursing care of patients in emergency situations

A. Measure and record intake and output



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**SIMULATION FLOW AND EXPECTED INTERVENTIONS**

| **State 1** | |
|---|---|
| **Patient Presentation** | **Expected Interventions** |
| Vital Signs:<br>BP: 82/60<br>HR: 128<br>RR: 34<br>$SPO_2$: 95<br><br>Cardiac Rhythm: Sinus tachycardia<br>Heart Sounds: Normal<br>Breath Sounds: Normal<br>Bowel Sounds: Absent<br>Diaphoresis: Cool/clammy skin<br>Cyanosis: None<br>Pupil: PERRLA<br><br>LOC:<br>GCS 8; E 2, V2, M 4<br><br>Facilitator Input (if required)<br><br>Skin cool to touch<br>Temp: 36.0 C | *Airway*<br>• Assess airway<br>• Assure adequate airway with NP/OP/ETT<br>• C-Spine precautions<br><br>*Breathing*<br>• Assess breathing<br>• Administer oxygen<br>• Chest tube as needed<br><br>*Circulation*<br>• Attach monitors<br>• Gain IV access (as needed)<br>• Begin IV fluid therapy<br><br>Survey to identify potential bleeding sources: physical exam, FAST, CXR, pelvic XR,<br><br>Stop external bleeding<br><br>*Disability*<br>• Neurologic assessment |
| **Expected Orders** | |
| Maintain airway; X-ray chest, pelvis, abdomen, blood lab work, endotracheal intubation if required, appropriate wound debridement and dressings, repeat labs; monitor fluid input/output. | |



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| State 2 | |
|---|---|
| **Patient Presentation** | **Expected Interventions** |
| Vital Signs:<br>BP: 70/40<br>HR: 148<br>RR: 40<br>$SPO_2$: 95<br><br>Cardiac Rhythm: Sinus tachycardia<br>Heart Sounds: Normal<br>Breath Sounds: Normal<br>Bowel Sounds: Absent<br>Diaphoresis: Cool/clammy skin<br>Cyanosis: None<br>Pupil: PERRLA<br><br>LOC:<br>GCS 7; E 2, V2, M 3<br><br>Facilitator Input (if required)<br><br>Skin cool to touch<br>Temp: 38.0 C | • Correctly interpret radiography & CT results<br><br>• Identify abnormal lab work<br><br>• Consider blood products; administer blood/FFP/platelets<br><br>• Monitor patient temperature<br><br>• Begin infection control<br>- Antibiotics<br>- Tetanus<br><br>• Call next level of care and deliver report<br><br>• Insert and assess placement of OG/NG tube<br><br>• Establish, maintain, and monitor urinary drainage system<br><br>Prepare for transport |
| **Expected Orders** | |
| Appropriate wound care; repeat labs; Blood products, continue monitoring patient, deliver report, call for surgery or evacuate patient. | |



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| **Lab Work** | |
|---|---|
| Time : 08:37 AM | |
| pH (7.34-7.46) | :7.38 |
| HC03- (22-26) | :18.0 mEq/L |
| Base excess (+/- 2) | : -6.4 |
| PCO (33-46) | : 21.6 mmHg |
| PO2 (75-100) | : 101.6 mmHg |
| SaO2 (> 95) | : 97% |
| Lactate (0-1) | : 6.6 mM |
| HCT (0.4-0.45) | : 0.35 mEq/L |
| K+ (3.6-4.6) | : 3.9 mEq/L |
| Na+ (133-143) | : 135 mEq/L |
| Cl- (60-100) | : 102.4 mEq/L |
| Ca++ (4.4-5.9) | : 5.1 mg/dL |
| Glucose (70-110) | : 79.5 mg/dL |
| Hb (10.0-14.5) | : 11.83 g/dL |
| CO-Hb (< 3) | : 0.00% |
| Time :0:900 AM | |
| Na+ (133-142) | : 135 mEq/L |
| K+ (3.6-4.6) | : 4.1 mEq/L |
| Cl- (60-100) | : 102.0 mEq/L |
| Glucose (70-110) | : 90.1 mg/dL |
| Calcium, ionized (4.4-5.9) | :5.2 mg/dL |
| Calcium, total (8.5-10.5) | :10.0 mg/dL |
| Magnesium sulfate (1.3-2.1) | :1.4 mg/dL |
| Hb (13.5-17.5) | :12.01 g/dL |
| HCT (40-45) | :36 |
| WBC (4-11*10^9) | :8.2*10^9/L |
| Platelets (150-400*10^9) | :279*10^9/L |
| Activated partial throboplastin time (APTT) (25-40) | :3.6 s |
| Prothrombin time (PT) (10-13) | :9.1 s |
| International Normalized Ratio (INR) (0.9-1.2) | :1.1 s |
| Fibrinogen (200-400) | :322.7 mg/dL |

Applicable Clinical Practice Guidelines:

- Management of War Wounds
- Infection Control



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**Simulator/Simulation Lab Orientation**

- Orient students to simulator capabilities
- Orient students to simulation work area
- Describe participant expectations
- Emphasize “sense of urgency”
- Emphasize team concept

**Team Resource Management**

- Establish a leader
- Delegate appropriately
- Brief, clear, specific, and timely communications
- Maintain Situational Awareness
- Assign Roles and Responsibilities
- Empower Team members
- Advocate for patient
- SBAR, call-out, handoff, patient report



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**Monitor Data**

| | | | | | |
|---|---|---|---|---|---|
| ☐ Art Line | ☒ Capnography | ☐ CVP | ☒ ECG | ☒ $EtCO_2$ | ☐ MAP |
| ☒ NIBP | ☐ PA Catheter | ☒ RR | ☒ $SpO_2$ | ☒ Temp | Other: |

**Equipment**

☐ Patient

☐ IV Pump (w/ primary sets)

☐ Suction (w/ tubing and canister)

☐ Propaq EL206 (w/ accessories)

☐ O2 Source

☐ Portable ventilator (w/ circuit)

☐ Defibrillator

☐ BVM

☐ ET Tube (7.5mm)

☐ Stylet

☐ Syringe 10cc

☐ Non-rebreather mask

☐ Laryngoscope (w/ appropriate sized blade)

☐ Thomas ET Tube Holder

☐ Miscellaneous 1st line ACLS drugs (RFID)

☐ Mannitol (RFID)

☐ C-collar

☐ SAM Splint

☐ Backboard

☐ 4x4s

☐ Kerlix

☐ Chest tube drainage system

☐ 20 Ga 1.25” IV catheters



Distribution A: Approved for public release; distribution is unlimited. Case Number: 88ABW-2014-1767, 17 Apr 2014

☐ 14 Ga 3.25” IV catheters

☐ IV start kit

☐ IV training arm

☐ Alcohol wipes

☐ Foley kit

☐ HPMK

☐ 0.9% NS

☐ 3% NS

☐ LR

☐ Blood Products

☐ Pen light

☐ JTTS Trauma Flow Sheets

## SIMULATION OPERATOR EXPECTED FLOW

**STATE 1**

Vital Signs:
BP: 82/60
HR: 128
RR: 34
$SPO_2$: 95

Cardiac Rhythm: Sinus tachycardia
Heart Sounds: Normal
Breath Sounds: Normal
Bowel Sounds: Absent
Diaphoresis: Cool/clammy skin
Cyanosis: None
Pupil: PERRLA

LOC:
GCS 8; E 2, V2, M 4

**If students do NOT give Blood products**

**STATE 2**

Vital Signs:
BP: 70/40
HR: 148
RR: 40
$SPO_2$: 95

Cardiac Rhythm: Sinus tachycardia
Heart Sounds: Normal
Breath Sounds: Normal
Bowel Sounds: Absent
Diaphoresis: Cool/clammy skin
Cyanosis: None
Pupil: PERRLA

LOC:
GCS 7; E 2, V2, M 3



Distribution A: Approved for public release; distribution is unlimited. Case Number: 88ABW-2014-1767, 17 Apr 2014

*Arterial Blood Gas*

Time : 08:37 AM

| | | |
|---|---|---|
| pH | (7.34-7.46) | : 7.38 |
| HCO3- | (22-26) | : 18.0 mEq/L |
| Base excess (+/- 2) | | : -6.4 |
| PCO2 | (33-46) | : 21.6 mmHg |
| PO2 | (75-100) | : 101.6 mmHg |
| SaO2 | (> 95) | : 97% |
| Lactate | (0-1) | : 6.6 mM |
| HCT | (0.4-0.45) | : 0.35 mEq/L |
| K+ | (3.6-4.6) | : 3.9 mEq/L |
| Na+ | (133-143) | : 135 mEq/L |
| Cl- | (60-100) | : 102.4 mEq/L |
| Ca++ | (4.4-5.9) | : 5.1 mg/dL |
| Glucose | (70-110) | : 79.5 mg/dL |
| Hb | (10.0-14.5) | : 11.83 g/dL |
| CO-Hb | (< 3) | : 0.00% |

*Venous Labwork*

Time : 09:00 AM

| | | |
|---|---|---|
| Na+ | (133-142) | : 135 mEq/L |
| K+ | (3.6-4.6) | : 4.1 mEq/L |
| Cl- | (60-100) | : 102.0 mEq/L |
| Glucose | (70-110) | : 90.1 mg/dL |
| Calcium, ionized | (4.4-5.9) | : 5.2 mg/dL |
| Calcium, total | (8.5-10.5) | : 10.0 mg/dL |
| Magnesium sulfate | (1.3-2.1) | : 1.4 mEq/L |
| Hb | (13.5-17.5) | : 12.01 g/dL |
| HCT | (40-45) | : 36 |
| WBC | (4-11*10^9) | : 8.2 *10^9/L |
| Platelets | (150-400*10^9) | : 279 *10^9/L |
| Activated partial thromboplastin time (APTT) | (25-40) | : 33.6 s |
| Prothrombin time (PT) | (10-13) | : 9.1 s |
| International Normalized Ratio (INR) | (0.9-1.2) | : 1.1 |
| Fibrinogen | (200-400) | : 322.7 mg/dL |



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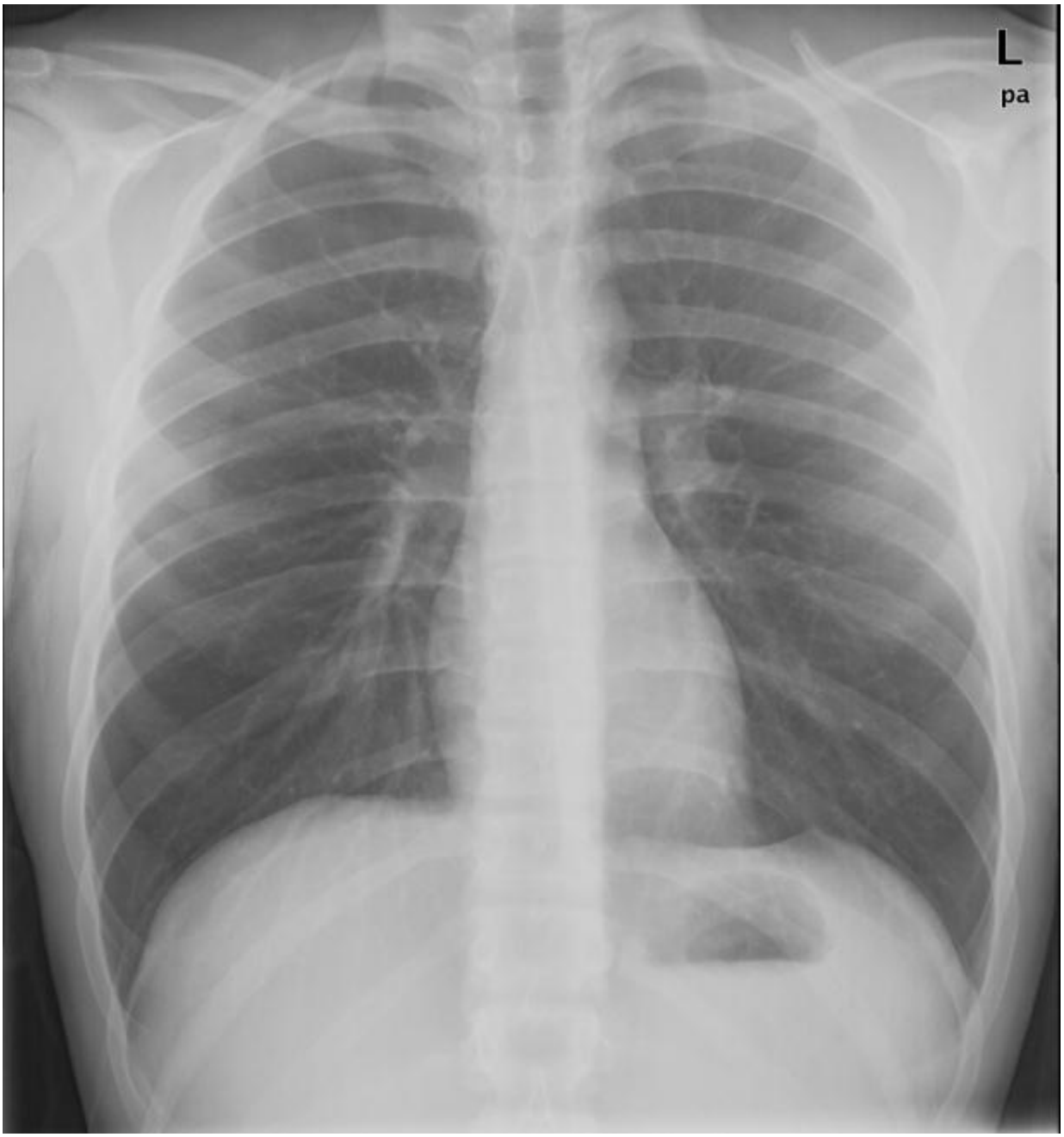




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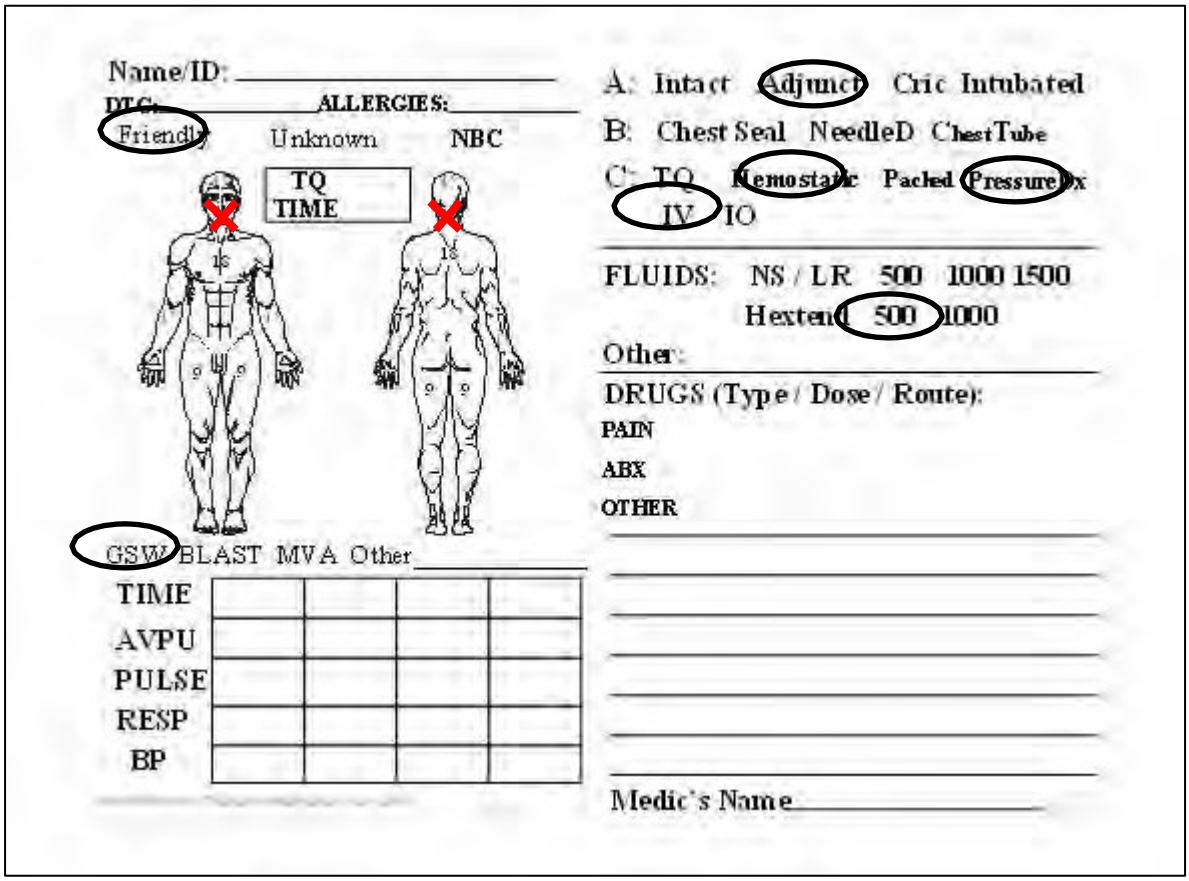
*TCCC Card*




*Note: This will be "on-the-fly" simulation. The simulation operator is expected to alter physiologic changes based on students' interactions*

Scenario created by: Keith A. Beaulieu, MBA
ICF International



Distribution A: Approved for public release; distribution is unlimited. Case Number: 88ABW-2014-1767, 17 Apr 2014

# APPENDIX B

## Clinical Performance Tool (CPT)



Distribution A: Approved for public release; distribution is unlimited. Case Number: 88ABW-2014-1767, 17 Apr 2014

# Clinical Performance Checklist-CHILD

**Global Score:**

| Rating | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| Descriptor | **Extremely Ineffective / Detrimental** | Consistently Ineffective / Very Poor | Mostly Ineffective / Poor | Somewhat Effective / Average | Mostly Effective / Good | Consistently Effective / Very Good | **Extremely Effective / Outstanding** |

Medical Scenario

| Event | Critical Actions Checklist | Inadequate | Adequate | Optimal |
|---|---|---|---|---|
| INFANT<br><br>6-mo-old male s/p IED blast while at wedding. Arrived via civilian CASEVAC to ECP; FST medics triaged and transported to medical station via gator. | Team Leader performs or ensures: | 1 | 2 | 3 |
| | Delegates roles effectively | 1 | 2 | 3 |
| | Clearly communicates with team members | 1 | 2 | 3 |
| | | | | |
| | Definitive airway established | 1 | 2 | 3 |
| | C-spine immobilization established/maintained throughout management | 1 | 2 | 3 |
| | Vital signs monitors placed within 2 min | 1 | 2 | 3 |
| | Large boare IV/IO within 4 min | 1 | 2 | 3 |
| | Starts IV/IO fluids | 1 | 2 | 3 |
| | Performs neurologic exam | 1 | 2 | 3 |
| | | | | |
| | Orders chest and pelvic x-ray within 8 min | 1 | 2 | 3 |
| | Orders appropriate lab tests/values | 1 | 2 | 3 |
| | Orders mannitol or hypertonic saline | 1 | 2 | 3 |
| | Completes secondary survey | 1 | 2 | 3 |
| | Completes secondary survey | 1 | 2 | 3 |
| | Detects change in vitals, performs reassessment | 1 | 2 | 3 |
| | Prevents hypothermia | 1 | 2 | 3 |
| | Initiates transport to higher echelon of care | 1 | 2 | 3 |



Distribution A: Approved for public release; distribution is unlimited. Case Number: 88ABW-2014-1767, 17 Apr 2014

# Clinical Performance Checklist-ADULT

**Global Score:**

| Rating | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| Descriptor | **Extremely Ineffective / Detrimental** | Consistently Ineffective / Very Poor | Mostly Ineffective / Poor | Somewhat Effective / Average | Mostly Effective / Good | Consistently Effective / Very Good | **Extremely Effective / Outstanding** |

Medical Scenario

| Event | Critical Actions Checklist | Inadequate | Adequate | Optimal |
|---|---|---|---|---|
| ADULT<br><br>26-yo 80-kg male was injured during an IED attack while riding in a HMVV as an unrestrained passenger | Team Leader performs or ensures: | 1 | 2 | 3 |
| | Delegates roles effectively | 1 | 2 | 3 |
| | Clearly communicates with team members | 1 | 2 | 3 |
| | | | | |
| | Definitive airway established | 1 | 2 | 3 |
| | C-spine immobilization established/maintained throughout management | 1 | 2 | 3 |
| | Vital signs monitors placed within 2 min | 1 | 2 | 3 |
| | Large bore IV/IO within 4 min | 1 | 2 | 3 |
| | Starts IV/IO fluids | 1 | 2 | 3 |
| | Performs neurologic exam | 1 | 2 | 3 |
| | | | | |
| | Orders chest and pelvic x-ray within 8 min | 1 | 2 | 3 |
| | Orders appropriate lab tests/values | 1 | 2 | 3 |
| | Orders mannitol or hypertonic saline | 1 | 2 | 3 |
| | Completes secondary survey | 1 | 2 | 3 |
| | Completes secondary survey | 1 | 2 | 3 |
| | Detects change in vitals, performs reassessment | 1 | 2 | 3 |
| | Prevents hypothermia | 1 | 2 | 3 |
| | Initiates transport to higher echelon of care | 1 | 2 | 3 |



Distribution A: Approved for public release; distribution is unlimited. Case Number: 88ABW-2014-1767, 17 Apr 2014

# APPENDIX C

## Behavioral Assessment Tool (BAT)



Distribution A: Approved for public release; distribution is unlimited. Case Number: 88ABW-2014-1767, 17 Apr 2014

# Behavioral Assessment Tool (BAT)

Created by JoDee Anderson, July LeFlore, Kristine Boycle, Mindi Anderson, Louis Halamek

There are five categories of skill level, 0-4 (poor to excellent, or novice to expert), as you watch the performance make tick marks under the number which best describes the behavior observed. You will observe many behaviors in the performance; score one person, not the team. At the conclusion, summarize your assessment by circling the number that best describes the participant's performance in relation to the characteristics listed (the number with the greatest number of tick marks). This is a behaviorally anchored rating system (BARS). If behaviors fall between the two described anchors, tick the coinciding number (1 or 3). Remain specific to the behavior observed.

## 1. Knowledge of the Environment

| | | | | |
|---|---|---|---|---|
| Appears disoriented; is unfamiliar with equipment; fails to ask questions of others in the environment | | Seems somewhat familiar with equipment; asks questions of other in the environment after struggling on their own; appears somewhat familiar with the environment | | Appears familiar with surroundings; appears thoroughly familiar with all equipment; readily queries others in the environment when questions arise |
| Poor<br>(0 points)<br>Novice | Partially Acceptable<br>(1 point) | Acceptable<br>(2 points)<br>Competent | Above Average<br>(3 points) | Excellent<br>(4 points)<br>Expert |

## 2. Anticipation of and Planning for Potential Problems

| | | | | |
|---|---|---|---|---|
| Does not appear prepared for the case; does not inquire of others to gather information; fails to assemble appropriate personnel; fails to react to changing circumstances as case evolves | | May ask 2 to 3 important questions regarding the patient; displays some understanding of possible problems and consequences; may not recognize predictable situations but adapts to changing circumstances; insures presence of necessary personnel and equipment | | Asks pertinent questions indicating an in-depth understanding of potential problems and subsequent consequences of the evolving case; does not appear surprised by predictable situations; insures presence of all necessary personnel and equipment |
| Poor<br>(0 points)<br>Novice | Partially Acceptable<br>(1 point) | Acceptable<br>(2 points)<br>Competent | Above Average<br>(3 points) | Excellent<br>(4 points)<br>Expert |

## 3. Assumption of the Leadership Role

| | | | | |
|---|---|---|---|---|
| Fails to clearly identify himself/herself; stands back; takes "hands off " approach; appears nervous; "rattled"; uncomfortable; fails to inspire confidence | | Identifies self after questioned; enters the situation and takes "hands on" approach when asked to; assumes leadership role but does not clearly coordinate activities of team | | Clearly identifies himself/herself as responsible for patient care; readily enters the situation; takes a "hands on" approach when necessary; coordinates activities of all team members; calmly inspires confidence in leadership |
| Poor<br>(0 points)<br>Novice | Partially Acceptable<br>(1 point) | Acceptable<br>(2 points)<br>Competent | Above Average<br>(3 points) | Excellent<br>(4 points)<br>Expert |



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## 4. Communication with Other Team Members

| | | | | |
|---|---|---|---|---|
| States problem in incorrect or confusing terminology; does not speak clearly; voice is either too soft or too loud; "talks down" to team members; does not clearly identify to whom he/she is speaking ("thin air" communications) | | Identifies problem but may not communicate clearly to others; tone of voice varies from soft to loud but audible by others in team; clearly identifies those to whom he/she speaks the majority of the time; requests cooperation and listens to others most of the time | | Specific in problem definition; speaks clearly, succinctly, and in even tones; can easily be heard by the other team members; clearly identifies those to whom he/she speaks; encourages cooperation; listens to others; clarifies ambiguous communication |
| Poor<br>(0 points)<br>Novice | Partially Acceptable<br>(1 point) | Acceptable<br>(2 points)<br>Competent | Above Average<br>(3 points) | Excellent<br>(4 points)<br>Expert |

## 5. Distribution of Workload/Delegation of Responsibility

| | | | | |
|---|---|---|---|---|
| Tries to "do it all"; fails to recognize the (potential) contributions of all care providers; does little or nothing when his/her assistance is required; asks that others exceed their abilities without providing appropriate guidance | | Delegates workload appropriately; assigns specific tasks to care providers but may not utilize those around to the best of their ability | | Clearly assigns specific tasks to specific care providers; recognizes when other personnel may be over-extended and assists or relieves them as indicated; provides appropriate level of supervision |
| Poor<br>(0 points)<br>Novice | Partially Acceptable<br>(1 point) | Acceptable<br>(2 points)<br>Competent | Above Average<br>(3 points) | Excellent<br>(4 points)<br>Expert |

## 6. Attention Allocation

| | | | | |
|---|---|---|---|---|
| Becomes caught up in the details and fails to see the "big picture"; does not prioritize demands for attention; easily distracted; unable to "tune out" unimportant input such as background noise | | Recognizes the "big picture" and able to tune out the majority of unnecessary details; adequately prioritizes; avoids fixation errors | | Cognizant of details yet adequately monitors patient's overall condition; does not become distracted; prioritizes well; avoids fixation errors |
| Poor<br>(0 points)<br>Novice | Partially Acceptable<br>(1 point) | Acceptable<br>(2 points)<br>Competent | Above Average<br>(3 points) | Excellent<br>(4 points)<br>Expert |



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## 7. Utilization of all Information

| | | | | |
|---|---|---|---|---|
| Does not incorporate historical information into approach to patient; fails to recognize disease states requiring intervention; is slow to recognize emergency situations; ignores part of data in formulating a diagnosis; avoids reaching a conclusion despite a reasonable database; fails to continually reassess; persists original course despite indications to change | | Incorporates pertinent historical information into approach to patient; interprets most physical findings accurately; assess need for intervention; recognizes changes in patient condition; reassesses patient status as needed | | Incorporates pertinent historical information into approach to patient; interprets physical findings accurately; repeats examination when findings are equivocal or obscure; correctly assesses need for intervention; readily recognizes changes in patient condition and keeps assessment of patient and management plan current; persistent in seeking information |
| Poor<br>(0 points)<br>Novice | Partially<br>Acceptable<br>(1 point) | Acceptable<br>(2 points)<br>Competent | Above<br>Average<br>(3 points) | Excellent<br>(4 points)<br>Expert |

## 8. Utilization of Resources

| | | | | |
|---|---|---|---|---|
| Fails to recognize professional skills of others; does not recognize potential alternatives when presented with equipment or personnel failures | | Utilizes expertise of other team members appropriately most of the time; may struggle with equipment or personnel failures but eventually problem solves for other solutions | | Solicits and incorporates expertise of other caretakers appropriately; reacts to equipment or personnel failures by identifying alternative solutions |
| Poor<br>(0 points)<br>Novice | Partially<br>Acceptable<br>(1 point) | Acceptable<br>(2 points)<br>Competent | Above<br>Average<br>(3 points) | Excellent<br>(4 points)<br>Expert |

## 9. Recognizes Limitations/Calls for Help Early Enough

| | | | | |
|---|---|---|---|---|
| Fails to recognize own limitations; does not request assistance when needed; recognizes own limitations but attempts to exceed these limitations, thereby placing patient at risk; calls for help when not indicated | | Recognizes own limitations in knowledge and skill but delays calling for help | | Recognizes when at his/her limits in medical knowledge and technical skill and readily asks for assistance; recognizes situations where additional help will be required and requests such assistance early |
| Poor<br>(0 points)<br>Novice | Partially<br>Acceptable<br>(1 point) | Acceptable<br>(2 points)<br>Competent | Above<br>Average<br>(3 points) | Excellent<br>(4 points)<br>Expert |



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## 10. Professional/Interpersonal Skills

| | | | | |
|---|---|---|---|---|
| Engages in unnecessary conversation; makes inappropriate comments; uses profanity; shows little concern for patient's comfort; approach to family members is demeaning, abrupt, clumsy or otherwise inappropriate; lacks communication skills; is unable to give or take advise gracefully; becomes defensive | | Keeps unnecessary conversation to a minimum; language and approach are professional most of the time; regards family with a caring attitude; recognizes and responds to the majority of nonverbal and verbal cues; supervises and teaches in a non-threatening manner | | Maintains composure; does not engage in unnecessary conversation; language and approach are professional at all times; demonstrates a caring attitude toward patients and families; recognizes and responds to nonverbal and attitudinal cues; encourages input from other team members; supervises and teaches effectively; non-judgmental; non-defensive |
| Poor<br>(0 points)<br>Novice | Partially<br>Acceptable<br>(1 point) | Acceptable<br>(2 points)<br>Competent | Above<br>Average<br>(3 points) | Excellent<br>(4 points)<br>Expert |



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# APPENDIX D

## Debriefing Assessment for Simulation in Healthcare (DASH)



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# Debriefing Assessment for Simulation in Healthcare (DASH) Student Version©

**Directions:** Please summarize your impression of the introduction and debriefing in this simulation-based exercise. Use the following scale to rate each of six "Elements." Each Element comprises specific instructor behaviors, described below. If a listed behavior is impossible to assess (e.g., how the instructor(s) handled upset people if no one got upset), don't let that influence your evaluation. The instructor(s) may do some things well and some things not so well within each Element. Do your best to rate the ***overall effectiveness*** **for the whole Element** guided by your observation of the individual behaviors that define it.

**Rating Scale**

| Rating | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|---|
| Descriptor | **Extremely Ineffective / Detrimental** | Consistently Ineffective / Very Poor | Mostly Ineffective / Poor | Somewhat Effective / Average | Mostly Effective / Good | Consistently Effective / Very Good | **Extremely Effective / Outstanding** |

**Element 1 assesses the introduction at the beginning of a simulation-based exercise.**

*Skip this element if you did not participate in the introduction.*
*If there was no introduction and you felt one was needed to orient you, your rating should reflect this.*

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- The instructor introduced him/herself, described the simulation environment, what would be expected during the activity, and introduced the learning objectives.
- The instructor explained the strengths and weaknesses of the simulation and what I could do to get the most out of simulated clinical experiences.
- The instructor attended to logistical details as necessary such as toilet location, food availability, schedule.
- The instructor made me feel stimulated to share my thoughts and questions about the upcoming simulation and debriefing and reassured me that I wouldn't be shamed or humiliated in the process.

**Elements 2 through 6 assess a debriefing.**

| | |
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- The instructor clarified the purpose of the debriefing, what was expected of me, and the instructor's role in the debriefing.
- The instructor acknowledged concerns about realism and helped me learn even though the case(s) were simulated.
- I felt that the instructor respected participants.
- The focus was on learning and not on making people feel bad about making mistakes.
- Participants could share thoughts and emotions without fear of being shamed or humiliated.



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| | |
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- The conversation progressed logically rather than jumping around from point to point.
- Near the beginning of the debriefing, I was encouraged to share my genuine reactions to the case(s) and the instructor seemed to take my remarks seriously.
- In the middle, the instructor helped me analyze actions and thought processes as we reviewed the case(s).
- At the end of the debriefing, there was a summary phase where the instructor helped tie observations together and relate the case(s) to ways I can improve my future clinical practice.

| | |
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- The instructor used concrete examples—not just abstract or generalized comments—to get me to think about my performance.
- The instructor's point of view was clear; I didn't have to guess what the instructor was thinking.
- The instructor listened and made people feel heard by trying to include everyone, paraphrasing, and using non verbal actions like eye contact and nodding, etc.
- The instructor used video or recorded data to support analysis and learning.
- If someone got upset during the debriefing, the instructor was respectful and constructive in trying to help them deal with it.

| | |
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- I received concrete feedback on my performance or that of my team based on the instructor's honest and accurate view.
- The instructor helped explore what I was thinking or trying to accomplish at key moments.

| | |
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| | _____ |

- The instructor helped me learn how to improve weak areas or how to repeat good performance.
- The instructor was knowledgeable and used that knowledge to help me see how to perform well in the future.
- The instructor made sure we covered important topics.

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## LIST OF ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| **AFMS** | Air Force Medical Service |
| **BAT** | Behavioral Assessment Tool |
| **CPT** | Clinical Performance Tool |
| **C-STARS** | Center for the Sustainment of Trauma and Readiness Skills |
| **DASH** | Debriefing Assessment for Simulation in Healthcare |
| **DGJ** | debriefing with good judgment |
| **DHPS** | Distributed Human Patient Simulation |
| **MASTRI** | Maryland Advanced Simulation, Training, Research and Innovation Center |
| **MATT** | Multiple Amputation Trauma Trainer |
| **PD** | plus-delta |
| **RSV** | Readiness Skills Verification Program |
| **STC** | Shock Trauma Center |



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